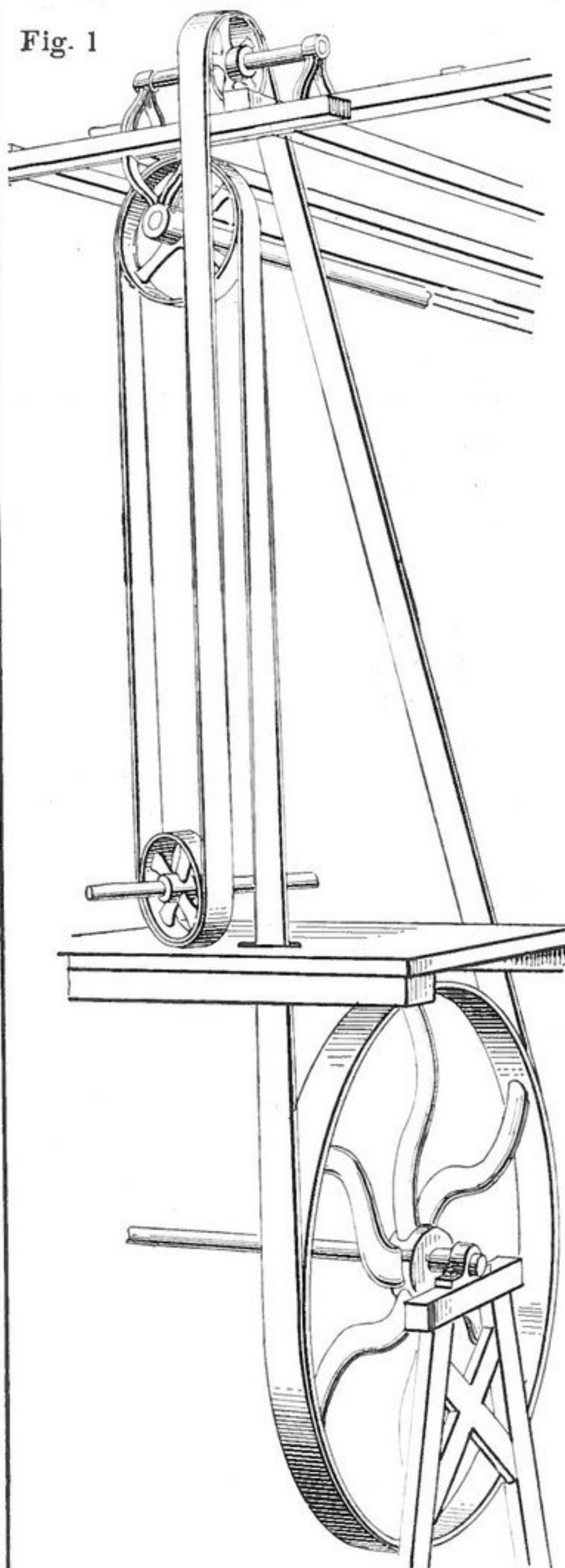


BELT TRANSMISSION WITH A WHOLE TURN IN TWIST OF THE BELT.

IN connecting a shaft with the main line by means of pulleys, a belt and a pair of guide wheels, advantage can be taken of the twist that may be given to the belt to bring the working surface in contact with each of the pulleys, and to bring the folds as direct as possible with the wheels they are to connect. We have made, says the Boston Journal of Commerce in its "Practical Mechanics," use of one whole turn in the twist given to the belt shown in the example illustrated in Fig. 1, where a quarter turn belt is required to connect the shaft in the first story with the large driving wheel in the basement. The driving stretch of this belt runs directly from the driven wheel to the main line, with a quarter turn in its twist, and lies in the plane of each wheel, so that the tension is as even as possible throughout every portion of its width. The slack side requires two guide wheels to receive the belt in the plane of the driving wheel, and deliver it in line with the receiving side of the one in the basement. The idle pulley on the floor of the first story receives the belt parallel with the driving stretch, as the driven wheel has an arc of contact of nearly one-half of a circle; and being on one side of the driving fold, while the receiving side is on the other, the belt must be conducted to a carrier-wheel above the driven pulley to deliver it in line with the receiving side of the driver. This method of belting, where the belt is carried around such a winding journey, would bring a whole turn in the twist by the time it had reached its starting place, but having received this amount of twist in opposite direction, it is counteracted and a straight fold is found on the slack side of the belt. In our practice we recently made use of this principle in applying a wide belt to a quarter-turn shaft where the working distance was very close and although the carrier wheels are out of level, we believe the belt has all the advantages found in an open belt, and suffers no worse in either of the folds than would be found in a crossed belt with twice the distance between the centers and the shaft's parallel. These conditions are easily seen in the drawing shown in Fig. 2, which was made as soon as the belt was laced and thrown on to the pulleys. We have other examples where the twist of the belt is made use of that show that the application is very extensive. In treating of the matter analytically we shall find that there are as many folds on open parts in the belt as there are wheels for it to pass over, these wheels forming the loops between each fold, the simplest being found in the open belt connecting a pair of pulleys, bringing the folds with two loops, as shown in No. 1, Fig. 3. The lower fold brings the driving stretch on the side that the pull comes. The upper fold represents the slack side with loop for the arc of contact, or the part comes in contact with the wheels. Now give one of these loops a half turn, so as to change ends of its position, and the belt is ready for pulleys that are to be driven in opposite directions, and the belt to work crossed instead of open, as shown at No. 2 in the same figure. If the belt was laced with a whole turn in the twist of one of the folds,

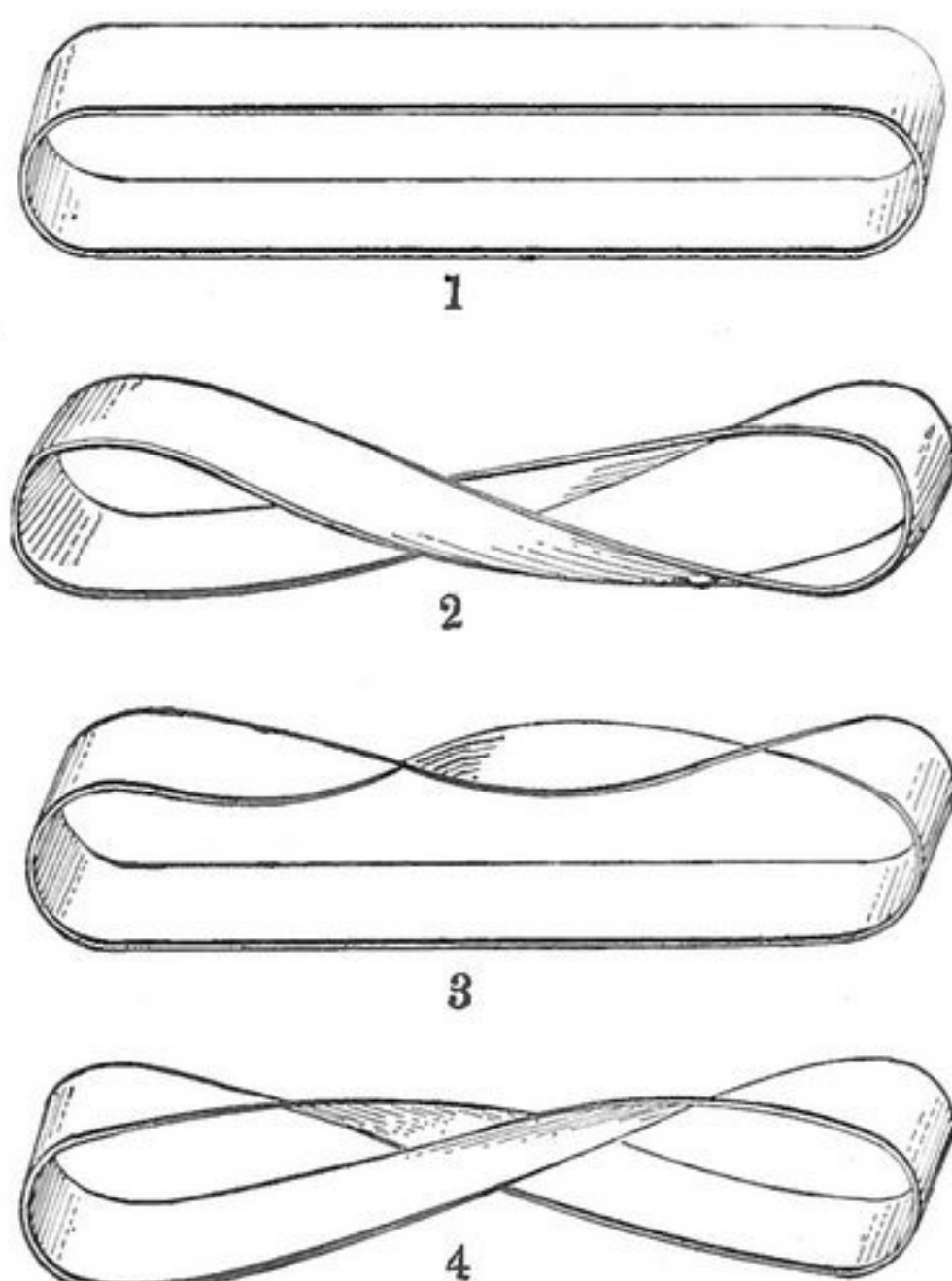
it would appear as seen in No. 3; then, by running this belt crossed instead of open in this fashion, giving the loop a half turn so as to untwist the twisted fold while the other is being twisted, and the belt will then ap-

Fig. 1



pear as shown in No. 4, with no more of a twist in either fold than is to be found in the regular crossed belt in No. 2. Only in one case the working surfaces slide on each other at the crossing of the belt; in the other the

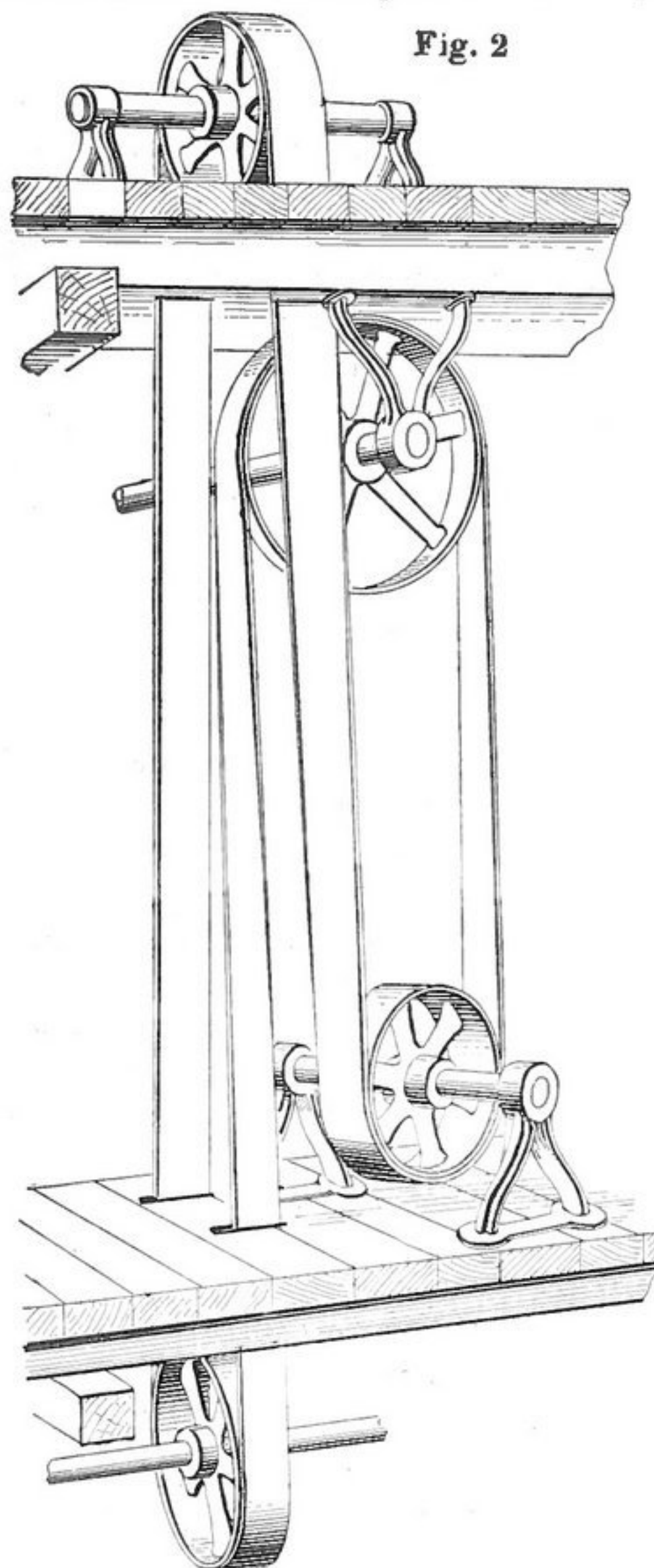
Fig. 3



inside of one stretch wears on the outside of the other. It will also be seen that in the perspective the crossing of the twist in each fold appears directly beneath each other in No. 2, at A B, while in No. 4, they

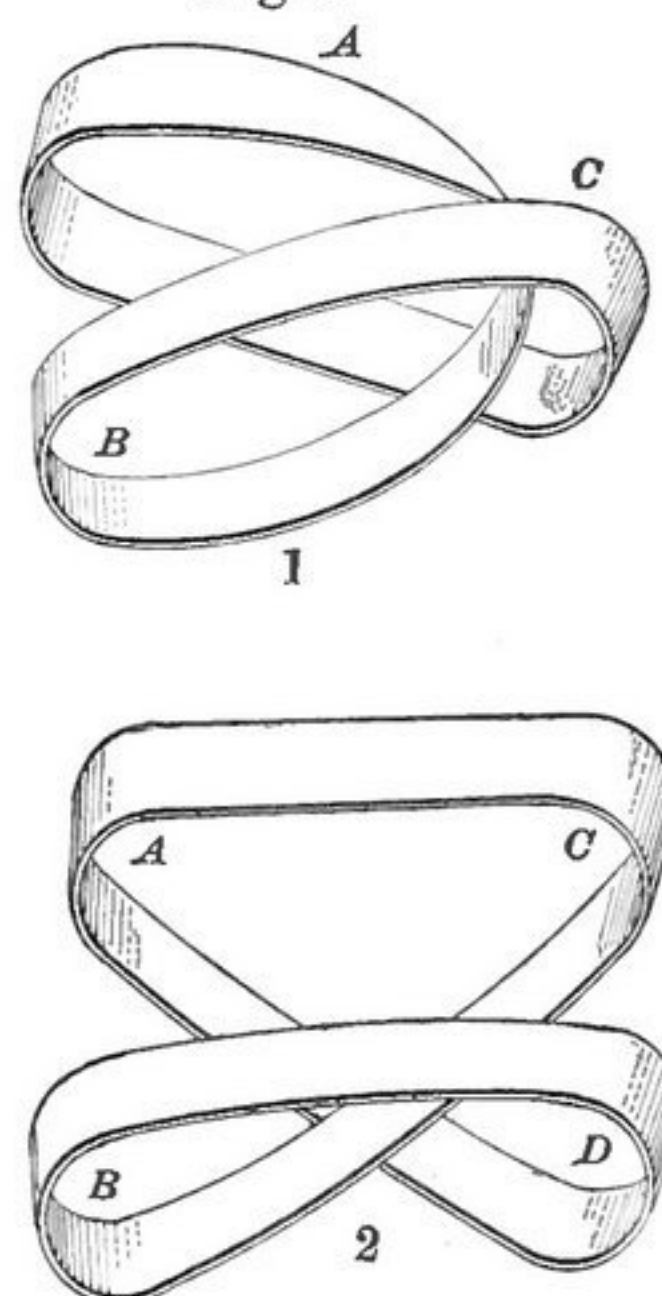
are on opposite sides of the crossing of the folds A B. To make use of these belts for four wheels for a driver and driven pulley and two carrier-wheels, they will need to be folded up so as to form four loops, one for each wheel with as many spans between them. The crossed belt in No. 2, when folded double in its simplest form, brings

Fig. 2



the belt with the four loops as shown in No. 1 in Fig. 4. In this condition the belt passes from A around two of loops to C, and down around the other to B with very little twisting of the folds but the remaining one, from B to A, is in a very bad working condition. This loop cannot be turned around in line with the others without bringing a half turn

Fig. 4



in the twist of one of the connecting folds. In folding the crossed belt, No 4 in Fig. 3 it has the advantage of giving up one-half of its twist in equalizing the twist from the folding for the four loops, and allowing the remaining half turn to be taken in in the half turn wind of the belt, removing the

twist entirely and leaving the fold with two of them parallel and the remaining two lying across each other, as seen in No. 2, Fig 4. We have now only to place these loops wherever the wheels are to be adjusted, and they can be made to occupy every position required for any direction of shafting, whatever the distance apart may be; and if the carrier wheels that are to support the remaining loops are placed so that the central line of each fold will intersect with those with which they are connected by the loops, the belt is ready to follow on the wheels in either direction they may be required to turn. In the simple matter of adjusting belts there are many places where a whole turn in the twist of a belt can be made use of to straighten out the condition of affairs and bring the load that the belt is to carry equally on each element of its width with no side draft for the belt to follow in a path of the double curvature.

THE DESIGN OF MODERN FLOUR MILLS.

The profitable conduct of a flour mill is governed by two primary functions, says Mr. Buchholz in "The Miller:" 1st, the purchase of the raw material in the cheapest market; 2d, the sale of the produce in the dearest.

The purchase of wheat in the cheapest market requires the mill to be capable of treating every wheat that may happen to appear there. When, by reason of the peculiar arrangement of the mill plant, a miller is restricted to the use of particular descriptions of wheat, such restrictions will tend to enhance their price; while by the operation of the same law of supply and demand, those wheats which he is debarred from using will tend to drop in market value and play into the hands of competitors. Moreover, a miller, by allowing himself to be so restricted, may destroy the difference of level between himself and his competitors which might otherwise result from fresh capital invested in the purchase and erection of new or additional plant. To sell the produce in the dearest market the miller must be in a position, by means of the machinery and its management, to manufacture the largest quantity of the very best quality the raw material is capable of yielding. Given the best combination of the best machines for a gradual reduction plant, the mechanical problem involved in the foregoing proposition, turns chiefly on the variation in the effect of a given grinding or dressing appliance on various wheats or their produce. For instance, harsh wheat products require more intense grinding, but less dressing surface, than mellow wheat. Hence a gradual reduction corn mill should be so equipped as to be capable of dealing with extreme variations of wheat.

The adaptability of the mill for the treatment of extreme variations of wheat depends on the following provision:—1. A sufficient margin of grinding power. 2. A sufficient margin of dressing surface, so contrived as to be controllable either for contraction or expansion. Excess of margin, however, involves: Waste of power. Waste of space. Increased first cost. Increased current expenditure. It is, therefore, necessary to devote the most searching study to the problem of accurately proportioning the plant to the work it is required to perform, with the view

of fulfilling the conditions just set forth—conditions, indeed, which should be held to rule with the rigor of mathematical axioms, from which to swerve is not merely dangerous but ruinous.

Another point deserves serious consideration on the part of the miller about to venture on the installation of a gradual reduction plant. The process of gradual reduction is based on the principle of roughly breaking up the wheat into products which shall not be flour, for the purpose of sorting such products on their qualitative merits—be they accidental or organic—with the view of treating each for the production of a corresponding quality of flour. It is obvious that such a process will always yield, at the termination of certain stages, small quantities of products, which, if classed separately, would be too insignificant in quantity to merit separate treatment and to occupy a separate machine. They have, therefore, to be classed with the class nearest in order of merit, and that to the detriment of the efficiency both of sorting and grinding machinery. It is obvious that the larger the output of a mill, the larger will be the quantity of each class of its products, and consequently the more numerous will be the classes, each sufficient in quantity to merit separate treatment; and hence, again, the larger the mill the more perfectly can be accomplished the classification, i. e., the gradual reduction.

Next in degree of importance are the arrangements for facilitating the management of the mill. Apart from the harassed state of mind which an unmanageable mill plant induces, a persistent difficulty in the working of machinery will inevitably provoke their neglect. It is not sufficient that machines run smoothly without interruption; they should at the same time thoroughly do their work. Yet it is the former that becomes the exclusive aim of the mill hands, when persistent difficulties recur in the manipulation of any machines. For these reasons: 1st. The machines selected for the mill plant should be of such simple construction, should be so powerful and adopted in such numbers, that they will perform their work with ease, and, therefore, run smoothly and uninterruptedly, while operating efficiently, during lengthened periods. This will enable the mill hands to give undivided attention to the performance of the machines, which they should be induced most vigilantly to maintain at a correct pitch. 2nd. In order to facilitate the control of the vigilance of the mill hands, the plant must be symmetrically disposed, easy means must be provided for testing its performance, and a system of control introduced in conformity therewith.

It may seem paradoxical to point to facts so obvious, but the rapid transformation of the whole mode of manufacture seems to have thrust them out of sight, while the hurried design and the precipitate erection of gradual reduction mills resulting therefrom, have promoted a state of things which makes their neglect painfully felt. Neglect on this head develops its effect most seriously just in those seasons when the margin for profit is narrowest.

Knowing the complicated difficulties of flour milling by the process of gradual reduction under the conditions which obtain in the United Kingdom, I have until recently felt the greatest reluctance to recommend its adoption. It would have been useless to explain my reasons. What possibility of being heeded on a subject which could only appeal to practical experience non-existent in this country, except in quite isolated cases? This reason for reticence, however, holds good no longer. A great number of the leading millers have plunged into the long-dreaded change, and of these a few are beginning to feel the true effects of that change.

At first, after adopting the new process, everything appears to be "couleur de rose." Patents, a quality of flour on a par with the better foreign brands, is produced such as was utterly impossible under the old regime. A few trial grists with all the new machinery, keen and in apple-pie order, show results satisfactory as to yield. Now the enterprising miller rapidly sells his "patents" at what he conceives a remunerative figure, and remains undismayed when he finds he has to be easy as to the prices for the secondary and third grades.

These pleasant auspices change after awhile. Neighboring millers become desirous of entering the lists with "patents," start gradual reduction plants, and then, passing through the same set of experiences as their pioneer, sell away those delightful "patents" most merrily. Basing their trade on this article, they forthwith undersell the original maker of it. This pioneer of the "new process," in the meantime, does not find the profits to answer his expectations, for the stocktaking at the end of a year's trading reveals figures that do not correspond with those calculated from the initial trial grists. To retract now is too late. The public have become accustomed to the superior article, and competition is there to supply it. There seems to be no issue but to continue on the path already entered.

Is it necessary to dilate on the difficulties of carrying on trade under the conditions and under the pressure of a reckless, because ignorant, inexperienced competition? There can be little doubt that under such continually increasing difficulties much greater and much more attention must be given to the design and construction, and, most of all, to the management of flour mills. Now arises the necessity of studying each design upon its special merits, based upon a natural development of the trade the miller has already established. But such separate study or each design is fatal to the contractor's essential—uniformity; and therefore it becomes absolutely necessary to disengage the design of the mill from the hands of the furnisher, whom the most powerful influence—the laws of economy—inevitably urge to organize his work for the production of uniform articles under the same set of plans, to thereby reduce first cost. The closer the competition the more powerfully will the mill-furnisher be urged in this direction.

But, it will be asked, is not such a natural development of economy the very result millers should endeavor to promote in these trying times of revolution? Economy! Yes, but not economy in the wrong place. To curtail the legitimate expenditure for the first outlay in the design and construction of the mill means the substitution of a continuous after-expense; it may mean the saving at the outset of £500 or £1,000 by having continually to pay 6d. or 1s. per quarter more for the wheat.

Are millers, then, to be thrown upon their own resources for the design of gradual reduction mills? Few millers have the leisure or the technical training needed for the elaboration of the details of such work. But no mill should be designed without the miller's concurrence—his hand should take part in drafting the broad lines, and his practical experience should be brought to bear on and vigilantly observe all points which affect or are likely to be affected by local needs.

A point of no mean importance is the danger arising from over-statements by vendors of machinery. Their representations, without being necessarily given in bad faith, are usually founded on maximum results, obtained under all the most favorable conditions it was possible to secure, and therefore asserted with confidence. Now, in order to guard against the tendency of adventurous trading induced by the expectation of, and belief in extraordinary results, based as they are on premises rarely

rigorously established, the miller requires to be told the average results, which take into consideration all the contingencies arising out of the natural course of manufacture and trading. Such facts, however, are most likely to be learnt from those whose professional reputation rests on the accurate knowledge of such facts, whose judgment and vision is not obscured by the strife and competition of trade.

In other departments of technical work the practice of resorting to professional advice for the design of mill plants, and the drafting of specifications in conformity with the most recent experience as a control and check on the manufacturers and vendors of special machinery, has been generally established. I venture to submit that this practice, being a rational division of labor, should be extended to flour milling. Millers who imagine they can get their designs made for nothing by mill furnishers, should reflect whether their experience can point to able men doing good work for nothing. Work undertaken under such a pretext is either scamped or paid for under cover of other charges, and therefore uncontrollable. I am aware that to the great majority of millers accustomed to the gorgeous pictures of the Eldorado in milling, as which gradual reduction is generally displayed to their admiring gaze, my words will find no echo, but those who have gathered experience during the last momentous years, who like to grasp a great task with the earnest painstaking which alone can secure its accomplishment, will understand me.

GRAIN ELEVATORS IN GERMANY.

[From *Allg. Muehlen und Masch. Ind. Zeitung*.]

An elevator built at Hamburg in 1878 covers an area of 1,600 square meters; of this two-thirds are taken up by the elevator proper and the other third by a common storage house. Owing to the swampy nature of the soil, great care and large expenses were necessary to prepare a foundation strong enough for the purpose. Piles, driven down as close as possible to each other, were cut off evenly at the low water mark and then covered by a layer of concrete almost seven feet thick. The elevator was built on the American pattern with wooden bins fastened on the most approved principle. All the well-known appliances for weighing, distribution to the bins, transferring of the grain from vessels into cars or wagons, in fact all the machinery tried and approved of for so many years in America, was incorporated into this elevator at Hamburg, thus reducing the manual labor necessary for its successful operation, to a minimum. Of course the necessity for handling the immense quantities of grain, gives rise to correspondingly larger elevators in America, but this one in Hamburg was considered large enough for the trade by having a capacity of 70 tons per hour.

While the storage of grain in elevator bins is looked upon as harmless in America, and although this fact has been known to German millers for the past ten years, it has nevertheless been the cause of constant struggles and discussions in the German grain trade. It is said that bin storage makes the grain mouldy, because it does not admit the air; but even if free ventilation helps largely to retain the grain in good condition, the main point to be considered is that it should be thoroughly dry before storing it. Well dried grain can be kept in bins for years without any harm whatever to its quality. Grain dried on the open field is kept in Russia, without any further care, in bags during the whole winter. Our storage rooms utilize the same principle on the different floors, where the grain is overturned until thoroughly dried. Although a large amount of space is saved in such a manner as compared to drying in

the field, it yet represents a waste as compared with bin storage, where all the space is utilized and machinery can be applied. In seaports, where real estate is high in price, the question of space will always be an important factor for the consideration of warehouse builders.

In spite of all these advantages, the elevator in Hamburg has been unable to gain the necessary support. Of course those trades directly interested in the handling of the grain have instituted the most decided opposition. It was said that the grain enclosed all around in a bin was inaccessible to any inspection by the purchaser; in addition to this the German grain merchants never clean the grain from bran particles or dust, because that would reduce its weight. Americans clean their grains before storing it, and look upon it as an improvement of their product, while the German grain dealers would complain about the removal of such impurities as an unnecessary waste; in addition to this, the fact that such cleaning allows of a better distinction between healthy and rusty kernels tells against the adoption of this measure in Germany.

In this way the grain dealers had such a long list of complaints against the bin storage of grain, that the owners of the elevator were unable to pay the expenses on their capital invested, and were forced to comply with the universal demand clamoring for a change of the elevator into the ordinary store house, which is now in course of construction, utilizing as much as possible of the material originally employed in the building of the elevator.

Such is the state of affairs in Hamburg. Nevertheless, it is simply a question of time to see the bin storage plan adopted, and especially in those cities where a very large amount of grain has to be handled regularly, the German prejudice will succumb first.

OVERTAILS.

In the best arranged and best worked of our roller mill plants, even where as many as eight reductions have been adopted to reduce the middlings, the final tailings, or some of the finished offals, always contain something "hard," which shows that the most elaborate of the new systems still leaves something to be desired, says a correspondent of *The Miller*, under the name of Revolving Brush. In like manner your elaborate system of collecting the news relating to milling, fails sometimes to convey "the gist of the news" to the editorial bins. The writer, like a revolving brush, proposes brushing together some of the tailings which have hitherto escaped the editorial sifter. As every miller is aware, in the best systems of modern milling double sieve purifiers are used, with return elevators fixed at the head of each machine, so that whatever "greys" pass the first sieve are sifted out in the purifier. In your American and Continental contemporaries, "Revolving Brush" often observes "greys" in the paragraphs referring to British and Irish milling interests, and "Revolving Brush" may, in sweeping over such paragraphs, act rather the part of the traveling brush as used on purifiers, that is, it "keeps the sieves clean." On the whole "Revolving Brush" will not be unlike a redresser. In the new roller plants one or more reels are used to redress the flour. Such is the care and efficiency in modern milling, that after the flour is made the whole of the finished product is rebolted through fine silks, so that if a "speck" has passed the ordinary dressing machines it is sifted out in the redressers. In giving the *modus operandi* which will be followed in brushing up the overtails, the *modus operandi* of a roller mill plant has been briefly sketched in words, instead of by means of the interminable names which milling engineers use when they sketch the run of the

material. In some modus operandis the run of the material is not spread evenly over the machines—some machines are overdone with work, while others are neglected. "Revolving Brush" will run the material in these notes so as to do justice to all, and if a double conveyor may sometimes be necessary to run in the reapings of some of the milling engineers, an extra "elevating" will be a just compliment to the enterprise that gathered them in.

In the above paragraph an outline of the plan carried out by the milling engineers in sketching the run of the material has been given, and for the benefit of those that still halt between two opinions, it may be well to follow it up, by giving some idea of how the plants are worked by the millers after they are erected. It is no secret that the proprietors of roller mills are getting large profits. The large profits are in many cases the outcome of the difference between the prices of the wheats ground. It is not exposing any secrets in stating that our roller millers produce a better sack of flour from cheap wheats, and obtain a higher price for it than the millstone millers are paid for flour manufactured from the best and most expensive wheats. "Revolving Brush," in gyrating from Penzance to Peterhead, has brushed over many neighborhoods, where millstone millers, in the fight to keep their trade together, are using wheats from 2s. to 3s. per quarter dearer than the wheats used by roller millers, and withal the trade of the user of the high price wheats continues to decrease. Roller milling is no longer an experiment, and the prejudices against it are passing away. It is well known that all who have put in the roller system are doing a larger trade than they formerly did with their old system, and many of them have more than double their outputs. When all the millers have attained such a position our markets will not be flooded with flour of foreign manufacture. British and Irish manufacturers in all industries have earned for themselves a good status by the marvellous improvements effected upon all their processes. The British and Irish millers are evincing enterprise and enlightenment not less creditable.

The foregoing paragraph was closed with a well-deserved compliment to the enterprise which is now the most distinguishing characteristic of British and Irish millers. It is to be regretted that the policy pursued by numerous landlords from whom the millers hold the mills on lease, does not tend to assist the millers in the march of progress. A vast number of landlords will not give their consent to the mill being altered to the improved systems. Hundreds of cases could be cited where skillful millers who wish to make the change are, through the obstinacy or ignorance of the landlords, bound hand and foot to the old method of milling. "Revolving Brush" a day or two ago was shown a letter from a Yorkshire miller, in which the writer stated, "I have still seven years of my lease to run, and can get no terms from my landlord. Sixty per cent. of my trade has gone within the present year, and already I see the beginning of the end." I have brushed up the details of the history of a change made by one of our well known firms of millers, who leased four mills on one of our classic rivers. They knew that the roller system was the system of the future, and were most eager to be among the first to adopt it; but their landlords would not make the change, nor yet allow the millers to do so at their own expense. Fortunately the leases of all their mills had but short periods to run, and they set about building a large mill of their own, and to-day the four mills they threw on the landlords' hands are unlet and are fast becoming ruins. If the landlords cannot see that a great revolution is going on in the milling industry the bankers are well aware of it. Bankers

have to understand the ramifications of all trades, and some of the chairmen of both British and Irish banks have publicly stated that they could only make advances on mills which contained the improved machinery. Landlords evidently still think millstones of much value, but the bankers are aware that there are hundreds of pairs lying all over the country which cannot be sold at any price, and in some cases the milling engineers have used them for foundation stones for the roller mills. When the gold medal of the National Association, which was won by Mr. F. Moss, junior, was first shown to a highly-respected South of England miller, he exclaimed, "Ah, see how lovingly the lady has her hand on the millstones, while the rolls are laid at her feet." This is all very good in sentiment, but in practice the rolls have had their revenge, and may, in the words of Scripture, say, "Behold, I have put mine enemy under my feet."

The millers and landlords have been brushed up and down in the above paragraphs, and a gentle touch up to the operatives will not be out of place here. A number of correspondents in recent issues of The Miller have complained of the inefficiency of the men who are employed at flour mills. There can be no doubt that all over the country a deeply-rooted prejudice existed among the operatives against the introduction of the new machinery. Like the operatives of all other industries, the men looked on the new machines as their enemies. Instances have come under the sweep of "Revolving Brush" where the non-success of a machine was due to the wish of the man in charge of it that it should not succeed. This spirit has not been widespread; on the other hand neither was there much anxiety among the men for improvement. A change is taking place, however, and already many of the operatives are among the most ardent investigators, and they look upon the present revolution as a point from which a new and gracious era of progress for milling in the country will take its opening. The operatives may rest assured that in no branch of industry does improved machinery tend to reduce wages. At present there is a demand for men skilled in the new system which cannot be met, and good wages are offered. In our automatic systems of milling the men are relieved from much coarse drudgery, but more skill and intelligence is wanted. Milling under the new system is a science, and as it develops it will open up a vast field for the employment skilled and intelligent operatives.

"Revolving Brush" finds that a general opinion prevails that flour milling, like many other industries, will fall into the hands of large firms and limited companies. There can be no doubt that roller milling will have this tendency. Roller milling can be as successfully worked in a small as in a large mill; of this there is no doubt, but a large plant is cheaper in proportion than a small one. From comparisons instituted, it has been found that high-class roller plants, to make from four to five sacks per hour, cost from £900 to £950 per sack for machinery; a plant of from seven to eight sacks per hour, £800 to £850 per sack; a plant of from 11 to 12 sacks per hour, from £700 to £750; while a plant to do 18 to 20 sacks per hour will cost only about £600 per sack. In many of the first plants the offals were too good, and the flour was not finished neatly, owing to want of length of machines. Millers are now aware that it pays to put in ample machines, and length and quality can only be got when this is done. In the early roller plants only four and five breaks were used, now six is the most common number, and it was readily observed that there are now seven breaks in Carter's system at Blackburn.

CURIOUS PATENTS.

Some investigating person, says the Boston Journal of Commerce, has furnished a brief list of patents on small things which in many instances have proved great mines of wealth to the lucky discoverer. The list might be extended to a much larger number, but we only state those given. Among these trifles is the favorite toy—the "return ball," a wooden ball with an electric string attached, selling for ten cents each, but yielding to its patentee an income equal to fifty thousand dollars a year. The rubber tip on the end of lead pencils affords the owner of the royalty an independent fortune.

The inventor of the gummed newspaper wrapper is also a rich man. The gimlet pointed screw has evolved more wealth than most silver mines, and the man who first thought of putting copper tips to children's shoes is as well off as if his father had left him two million dollars in United States bonds. Although roller skates are not so much used in countries where ice is abundant, in South American, especially in Brazil, they are very highly esteemed, and have yielded over one million dollars to their inventor. But he had to spend fully one hundred and twenty thousand dollars in England alone fighting infringements. The "dancing Jim Crows," a toy, provides an annual income of seventy-five thousand dollars to its inventor, and the common needle threader is worth ten thousand dollars a year to the man whose thought produced it.

The "drive well" was an idea of Col. Green, whose troops, during the war, were in want of water. He conceived the notion of driving a two-inch tube into the ground until water was reached and then attaching a pump. This simple contrivance was patented after the war, and tens of thousands of farmers who have adopted it have been obliged to pay him a royalty, a moderate estimate of which is placed at three million dollars. The spring window shade yields in income of one hundred thousand dollars a year; the stylographic pen also brings in one hundred thousand dollars yearly; the marking pen for shading in different colors, one hundred thousand dollars; rubber stamps the same. A very large fortune has been reaped by a western miner, who, ten years since, invented a metal rivet or eyelet in each end of the mouth of coat and pants pockets to resist the strain caused by the carriage of pieces of ore and heavy tools.

THE opinion prevails among freight men and shippers that January will bring a heavy eastbound traffic; that there will be a large movement of grain especially, and also of live stock. They base this belief on the fact that the interior markets are lightly supplied with corn and oats. There is an increasing export demand for corn and flour, and prices in Eastern and export markets, more especially of corn, are likely to adjust themselves to the rail rates, fulfilling the prediction of some of the best posted freight men that if the roads would restore and strictly live up to the established tariff, in twenty to thirty days the roads would have all the business they can well handle, and derive some revenue for carrying it.

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Advertisements under this head, 25 cents each insertion for 25 words, and 1½ cents for each additional word. Cash with order. Three consecutive insertions will be given for the price of two.

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By a man who has had fifteen years' experience in running grist and merchant flour mills. Address, Wm. H. WOLLERTON, McElhatton P. O., Clinton county, Penn. 411

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I will sell one "Yale" vertical mill, style B, 12 inch burrs, all iron frame, entirely new, never having been used, very, very cheap for cash. Address "Bargain" care THE MILLING WORLD, Buffalo, N. Y.

YOU CAN BUY THESE CHEAP.

Three McCully Corn Cob Crushers. The above articles are brand new, in perfect condition, just as they left the factories, and will be sold very cheap for cash. Address S. 30, care THE MILLING WORLD, Buffalo, N. Y. 41

FOR SALE CHEAP.

Four-run water powered grist and merchant mill, with a good custom. All modern improvements to make first-class flour; machinery new; in a good grain-growing section on railroad. Would sell all or one-half. For further information inquire of GILGER & LONG, Hadley, Mercer county, Pa. 812

FOR SALE CHEAP.

One 6-horse power engine and 10-horse power boiler, all complete, price, \$350; one 8-horse power engine and 10-horse power boiler, price, \$375; one 10-horse power Portable complete, price, \$350; one 10-horse power Russell Traction, price, \$500; one 4-horse power vertical engine, price, \$120. Call or address for particulars, EZRA F. LANDIS, Lancaster, Pa. 262

FISKE'S BOLTING REGULATORS

Keep the bolting cloth clean in all kinds of weather and in handling all kinds of stock. Increases the bolting capacity from 25 to 50 per cent., and prevents making specky flour. No shafting, belting or gearing required. Any one can attach it. I have a few of these devices which I will sell cheap. They are brand new. Send for description and price. Address MILL-WRIGHT, care THE MILLING WORLD, Buffalo, N. Y. 41



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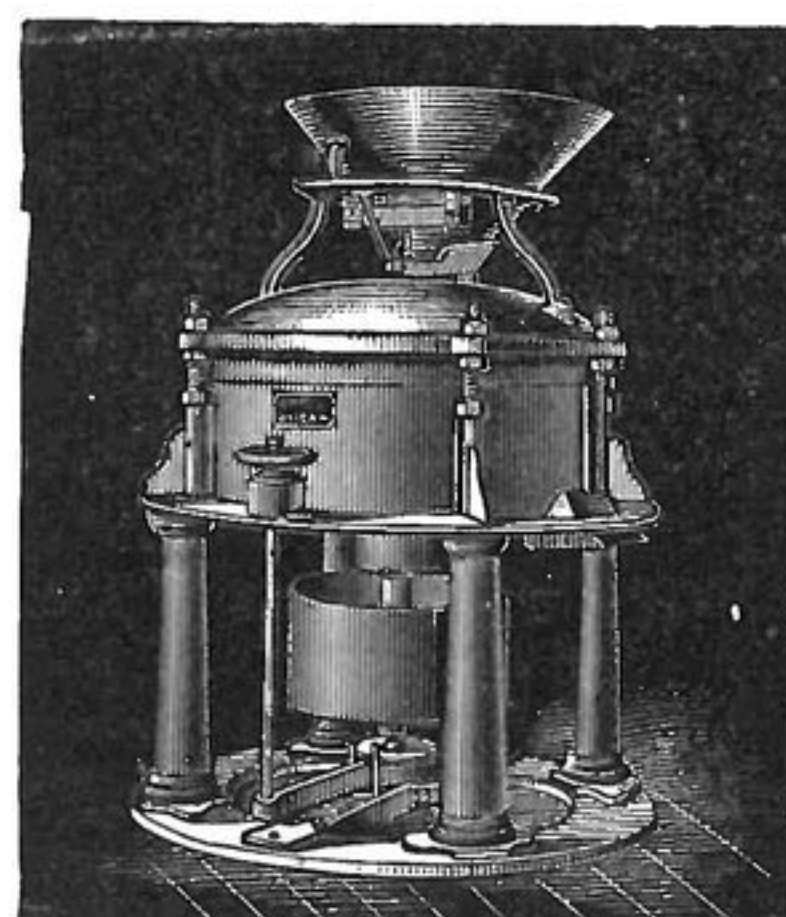
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Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

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COMPANIONSHIP in misery seems to offer some consolation to the sufferer, as illustrated by one of our Austrian exchanges which tells its readers that: It is of extraordinary interest to be able to state that even in the United States wheat is produced at a loss to the grower.

THE Electrical Exhibition at Boston was opened on December 8. Like at all exhibitions things were by no means ready at the appointed time, but the exhibit is stated to be very interesting already, and additions are put in place as fast as time permits.

After a week or two reports will come in and we will be able to state whether the exhibition holds anything of practical value to millers outside of the electric light.

THE International Exhibition at New Orleans was opened on Dec. 16, with imposing ceremonies. Even in its incomplete state at the time, a fault by the way that seems to be chronic with all such undertakings, the enterprise is considered a great success, which will improve yet after a few weeks when all the exhibits will be in position.

To those of our readers who are especially interested in money matters, (for in a general way they are of all-absorbing interest to all) it may be of interest to know that within the next twelve months the corporate existence of no less than eight hundred and seventy-four national banks will expire, which have an aggregate capital of \$245,132,845, nearly one-half of the whole national bank capital of the United States.

As an illustration of conservatism and persistency of inherited ideas we call attention to the translation on another page of "Elevators in Germany." If such things can happen in the city of Hamburg, usually considered one of the most progressive cities on the European continent, we must not be surprised if we hear of opposition against improved grain elevators in the interior sections of Europe, and withall in Russia. This occurrence plainly demonstrates that the necessity for an improvement must be felt by those directly interested, before any such improvement will be accepted or can be worked on a paying basis.

A MASS petition, signed by 30,000 signatures, has been presented to the German Parliament, asking for an increase of 200 per cent. of the tariffs on American and Russian grains and flour. As the difficulty in obtaining a large number of signatures to almost any, even the most senseless petition, is probably as small, or even smaller, in Germany than it is in America, and knowing how small an effort is needed in that respect in the United States, the weight to be attached to such a monster petition is really insignificant: it may be large quantitatively, but qualitatively it is undoubtedly small in comparison, and the German Government will readily recognize this fact before taking any definite action in the matter.

ALTHOUGH the flour market appeared fairly active during the past week, the prices have not improved, and export orders are few and far between. It really seems that Europe is provided at least for the present time. The aspect of milling has been anything but rosy during the past few months, and the prices have reached what must seem to be the lowest possible limit. In the middle of October spring patents were quoted in the New York market at \$5.15, and many have since then declined to \$4.25 and \$4.00. This deterioration has affected the values only, the quality is of as high an order as ever. If cheap food can make a nation happy, the present status of the flour market must have a marked influence in that direction.

THE query, "is the present price of wheat artificially low," is answered by the New York Produce Exchange Reporter, as follows: When the declension of property values generally are considered and compared, the decline of the value of wheat is not so wonderful after all. Relatively, the fall in wheat with the fall in other articles may have been greater, but this may have arisen mostly from the fact that wheat is more particularly an article of speculation. There is no doubt that the depressing tendency of

the times has had an exceptionally bad influence on the wheat markets and lowered prices, but, as far as it goes, this is a very strong point against the theory of overproduction. One other, and perhaps the primary reason why the price is so low, is because the farmers of the world have had to sell so much more wheat than in former years to realize the same amount of money to pay rents and debts. The primary causes lowered the prices, and their effect again became the cause of the subsequent reduction by forcing upon the markets more than they could take for the time.

THE conviction seems to gain ground among the agricultural population of Minnesota that the next legislature will enact some laws in regard to wheat grading. Some measures, desired by many, seem to be exceedingly necessary. When the farmers bring their grain to the elevators they claim that they are either cheated out of their profits, or are at least so completely at the mercy of the elevator men as to have to accept whatever price is offered. The elevator men again claim that their establishments are of direct benefit to the farmers, who seem to have the erroneous idea that the volume of their wheat delivered represents actual grain, and who consider themselves outraged if a dockage is imposed upon them for dirt. As it is perfectly natural that the producer will try to sell his grain at as high a grade as possible, while on the other hand, the purchaser will endeavor to pay for the lowest grade possible, the warring factions will never agree unless some law is enacted which establishes certain rules for grading. Then this long continued discussion will come to an end and perhaps both sides will admit, after a short operation of the law, that they were as well off without it, and that the customary regulations of ordinary commercial transactions are just as efficient under ordinary circumstances, as any law enacted by the government. If Minnesota succeeds in the experiment, Dakota and the other wheat growing states of the Northwest may feel a desire for similar laws, and a national system of wheat grading may be the final result.

THE government mills grind proverbially slow, and it takes a long time before the grain, in the shape of necessities, is pushed through all the gradual reductions of legislative wisdom and finally startles the world in the form of "high grade" wise laws relating among many other things to patents; not patent flours, but patents to the product of the inventive genius of the country. There seems to be something wrong in the system. The preliminary cleaning has been done very thoroughly; for several months past all the technical journals of the country have most unanimously sifted the dust and dirt out of the present crude work done by the Patent Office at Washington, but somehow the rollers do not seem to take hold and the second break of improved conditions has yet to be recorded. The slow old system, by which an inventor has to wait several months before he can obtain a patent, sadly needs a remodeling according to a new plan, speedy enough to satisfy the constantly increasing demands of the country. It seems that the "agents" of the government mill are satisfied to run the institution on the old-fashioned plan, unless they can increase their "percentages" under the new system. Now it happens that, as a rule, inventors are a rather poor set of men, unable to invest in the necessary "lubricants" to increase the speed of the machinery, and the consequence is, that they must wait. The question is how long will such a state of affairs last? Thirty-five thousand patents a year with the prospect of a rapid increase of the numbers and a

surplus of millions of dollars to the account of the office, show very conclusively that the Patent Office work is of the greatest importance to the country, and we sincerely hope that the incoming legislation will solve the problem in a manner satisfactory to all.

THE little moth, injurious to flour, which has recently done a large amount of damage in Germany and Holland and is said to be imported from America, is still under discussion in the German milling journals. Perhaps some of them will use it as a lever to demonstrate the necessity for the exclusion of American flours from the German market, in the same manner as the "Trichinas spiralis" afforded a convenient excuse for the closing of the German markets against the American hog. The fact of the matter is that it has never been known to do any damage to flour on this side of the Atlantic, while it has been described as very destructive as early as 1879 in a large number of mills and starch factories in Holland. Along the Rhine it has been known for several years, and while the millers of Holland attribute its introduction to the imported American corn, the millers along the Rhine believe it is due to the American wheat. So the question seems to be far from a satisfactory solution, and we would not be surprised if a careful collection of historical facts, such as are constantly compiled by American entomologists, would prove that the moth was indigenous to Germany, and that, contrary to the statement of its introduction from America, it had, as usual, moved from the east to the west along the same route where the largest part of our injurious insects have traveled. Small as the whole matter appears, in the present period where every European country tries to isolate itself from outside communication by high tariffs, there is no telling but that the mole hill may be transformed into a good sized mountain by constant repetition of the story.

ANYTHING connected with improved transportation facilities is of interest to the producers of the land, and therefore the proposed treaty between the United States and the State of Nicaragua with regard to the Nicaragua ship canal is important enough to merit at least a passing notice. The treaty provides that the canal shall be built by the United States, and owned by the two governments conjointly, who shall form a perpetual alliance. The canal is to be built along a route selected by the United States, while Nicaragua gives the free use of lands, water and places within her borders necessary for the construction and maintenance of the canal and of a railroad and telegraph line. A strip of land two and a half miles wide with the canal in the center, will be owned by both governments, but under Nicaragua jurisdiction. The management of the canal is left in the hands of six commissioners, three from each government; the tolls will be levied on the vessels of all nations equally and the revenue from canal, railroad and telegraph, after paying the expenses, shall be divided and one-third is to go to Nicaragua and two-thirds to the United States. The climate along the route is said to be healthy and temperate; the length of the proposed canal will be 145 miles, but of these the Lake Nicaragua forms 120 miles, so that the length of the artificial waterway will be only 25 miles, which, it is hoped, can be constructed for \$50,000,000, and be completed in a few years. The advantage of such increased facility for communication between our Atlantic and Pacific ports cannot be over estimated when we compare it with the present tedious and dangerous route around Cape Horn. With the Nicaragua canal in full operation and the Panama canal ready for traffic, there will be no danger of any monopoly and the water routes may again assert their superiority over railroads.

ESTABLISHED 1856.

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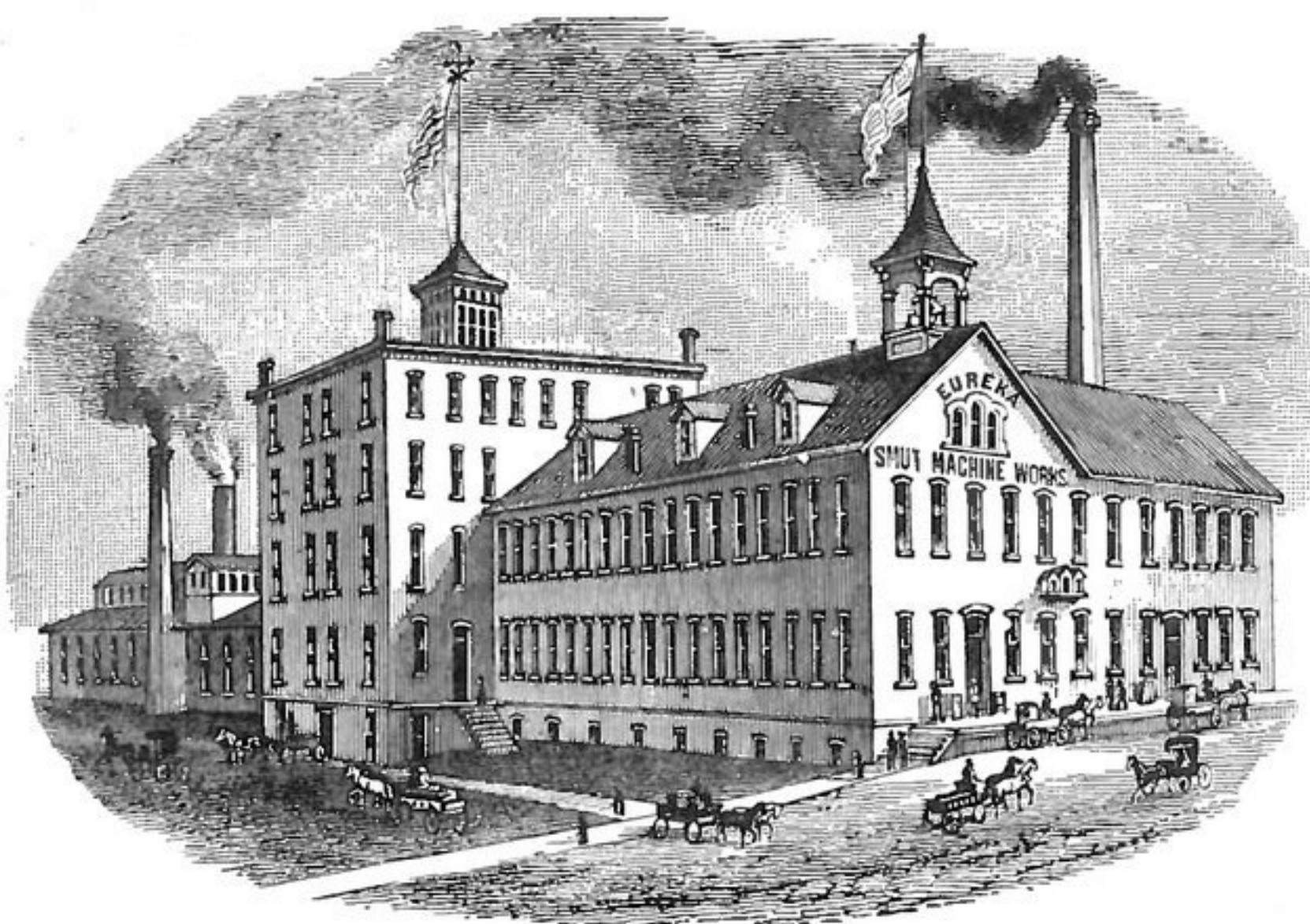
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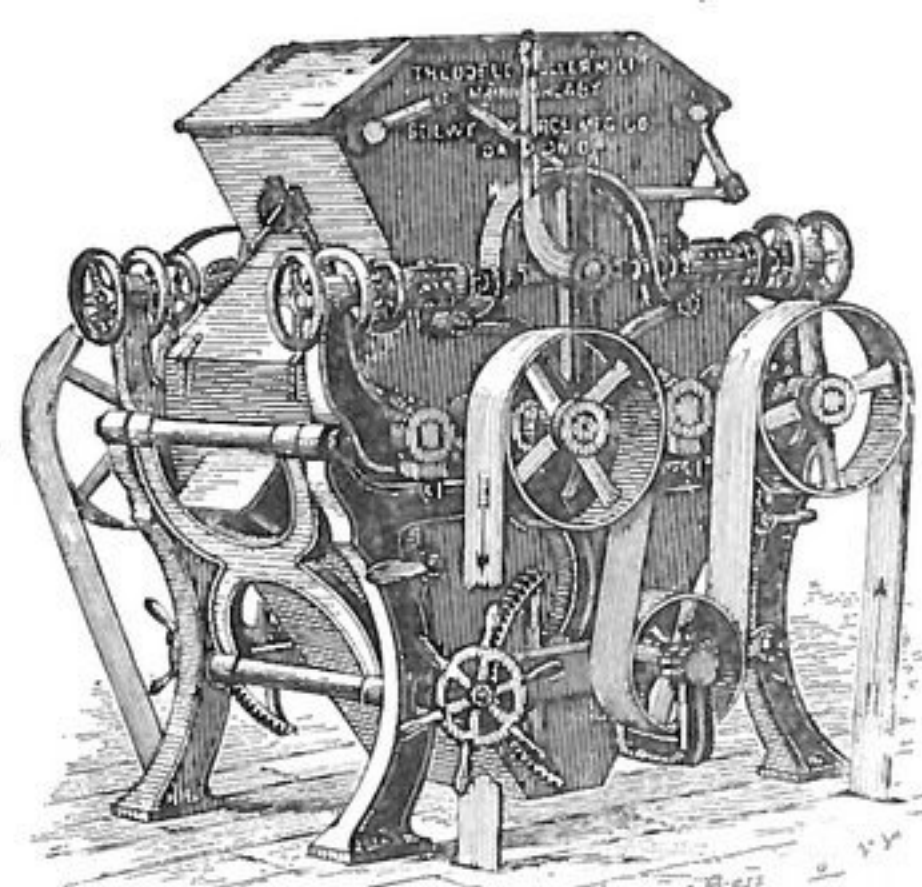
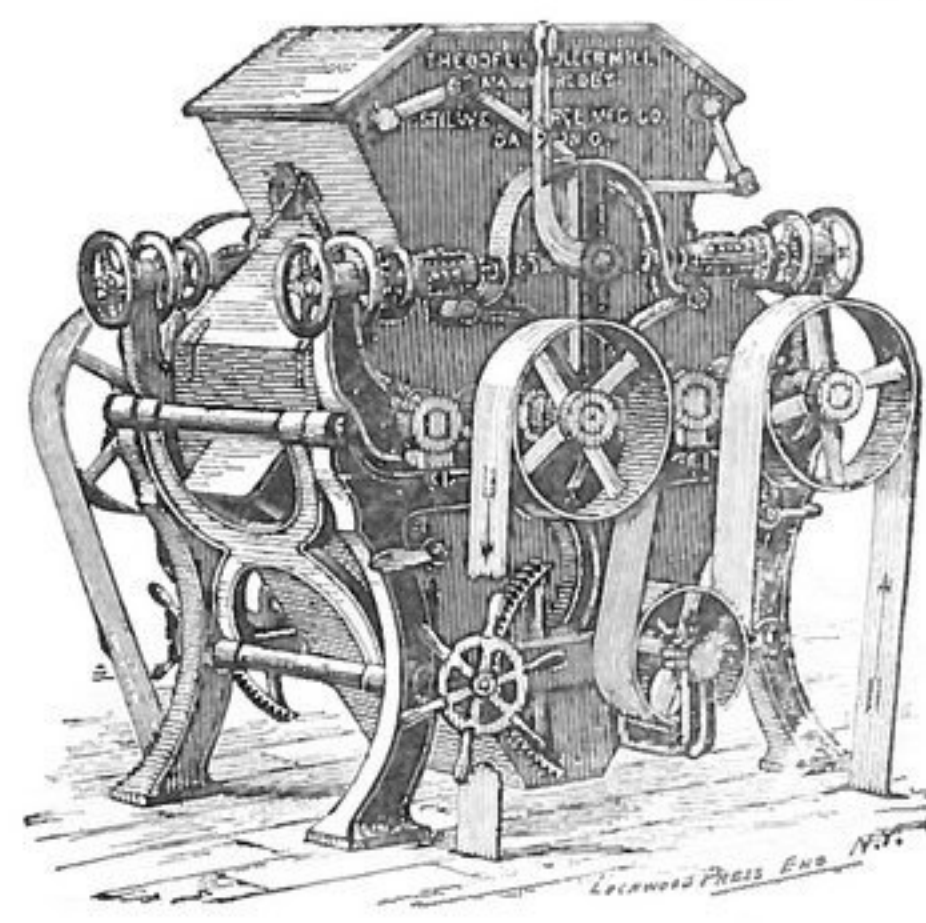
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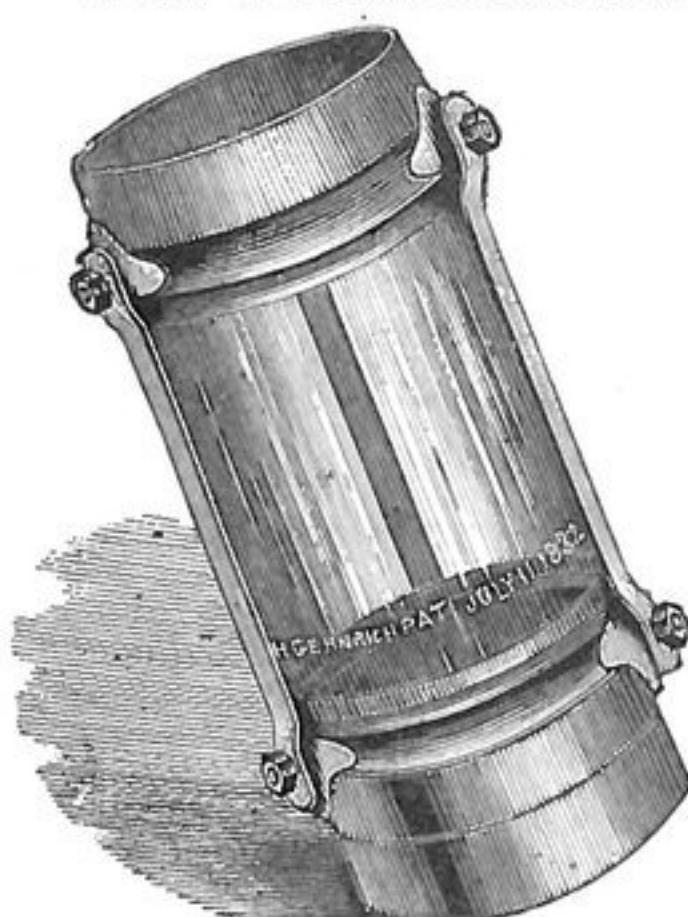
Desirable,

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THE ODELL ROLLER MILLS



GEHRICH'S PATENT GLASS TUBE JOINTS
AN IMPORTANT INVENTION FOR MILLERS.



This invention consists of a Glass Tube Joint, which can be made to correspond in size to and be inserted in any tin spout used to convey grain, meal, etc., in the operation of Grinding Flour and other substances. A section of the spout is thereby *Rendered Transparent*, enabling the miller, or any one passing by, to see at a glance whether the contents of the spouts are properly running. By the use of this appliance the necessity of frequently opening spouts is avoided, and the consequent saving of time and flour is very important in an economical point of view. These Glass Tube Joints have given the most complete satisfaction, and are esteemed as an indispensable requisite wherever they have been applied. Full information furnished on application to the inventor.

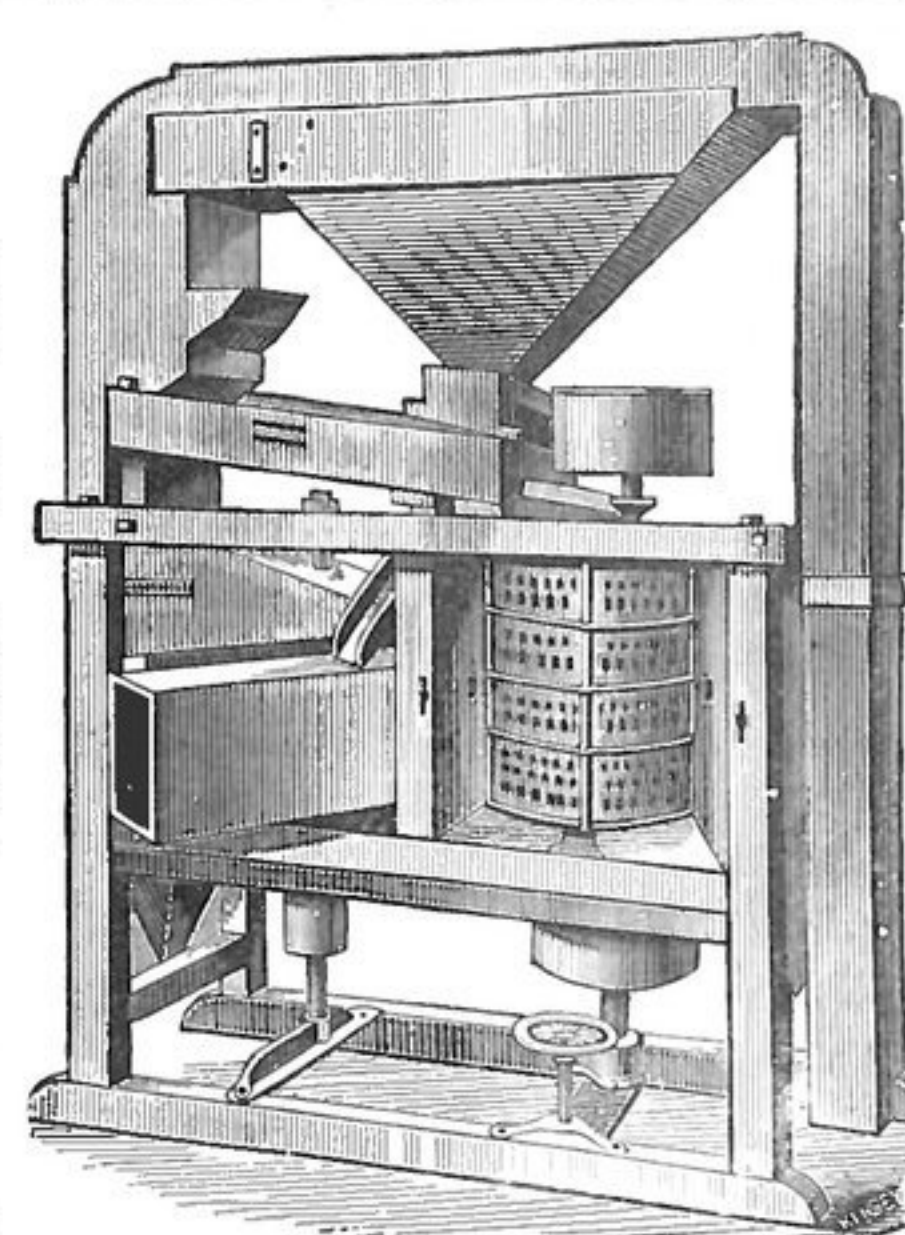
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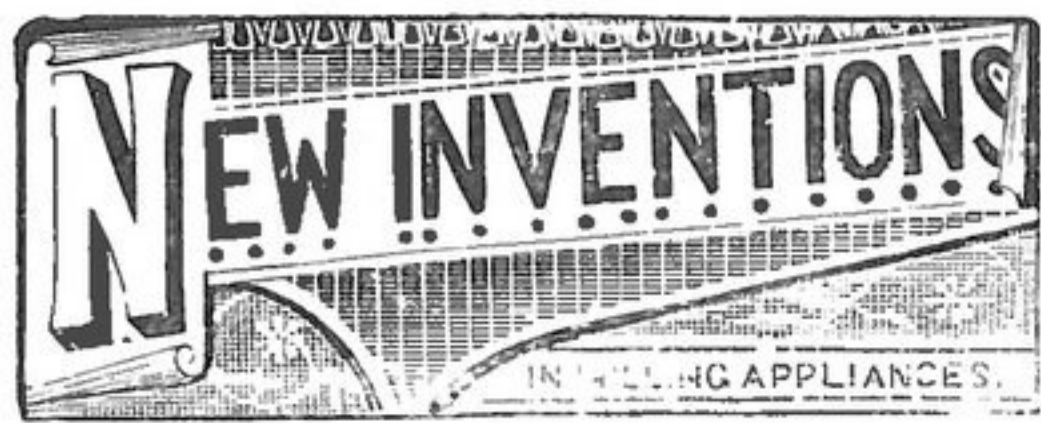
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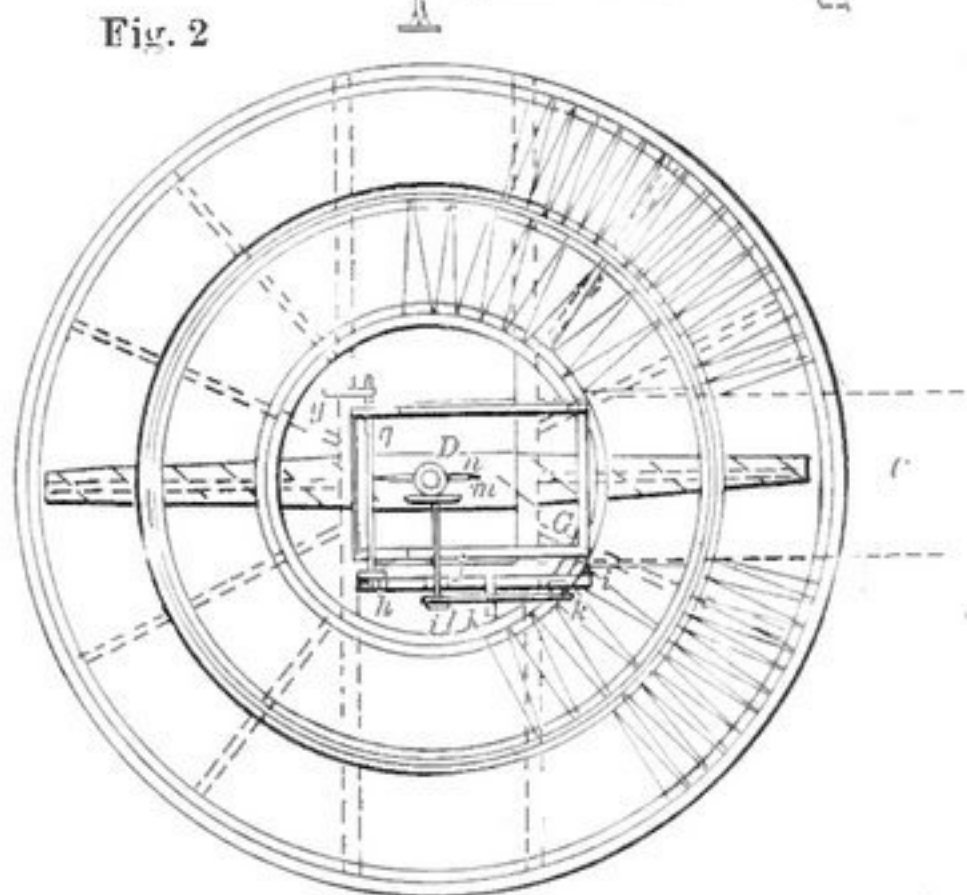
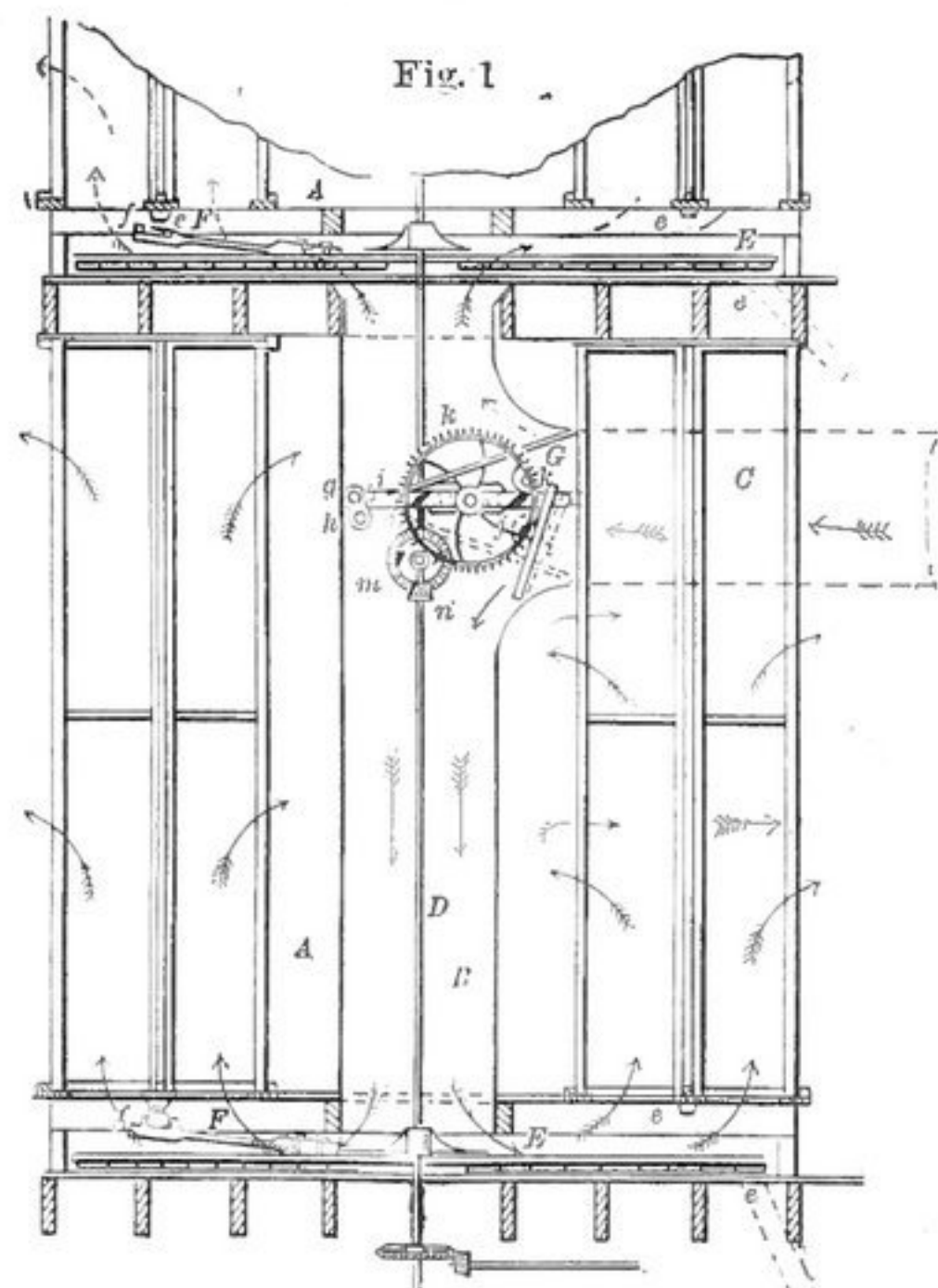
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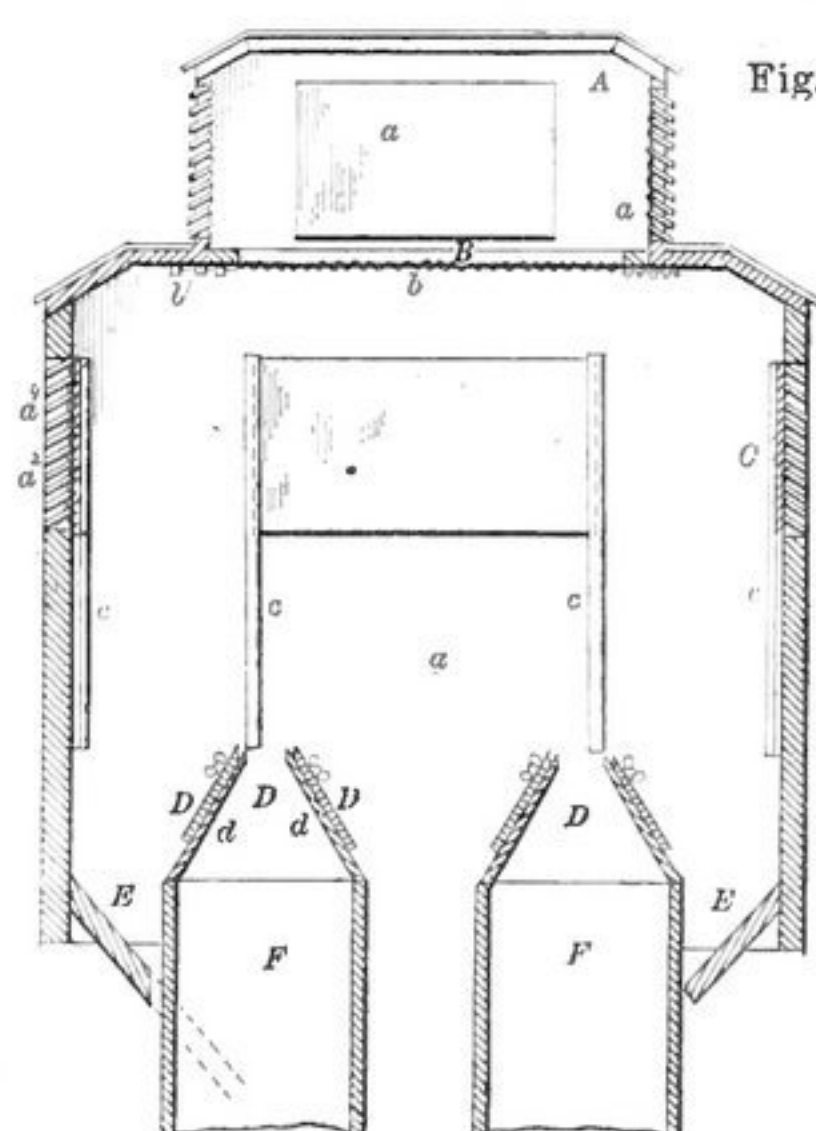
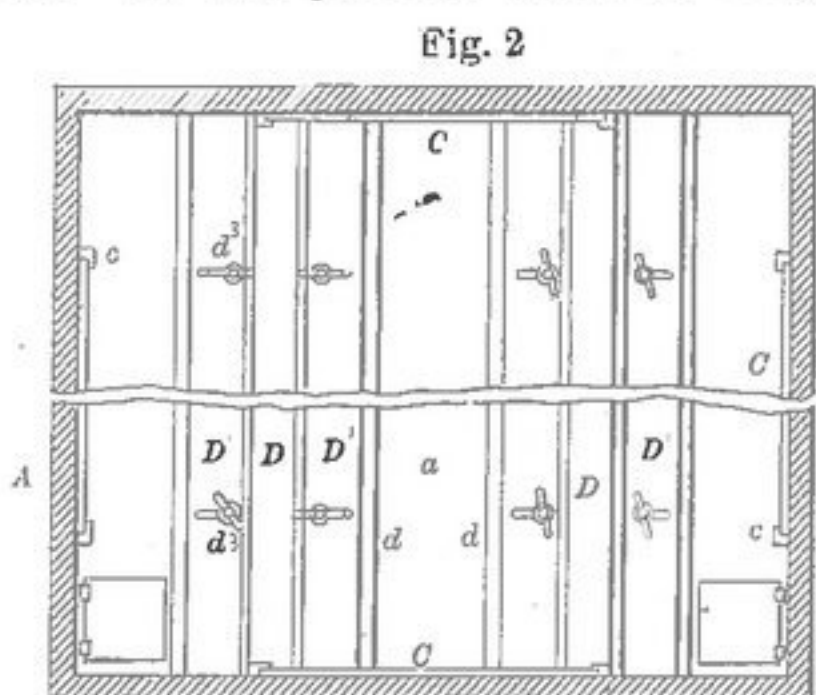
**DUST-COLLECTOR.**

Letters Patent No. 308,898, dated Dec. 9, 1884, to Henry Keiser, of Bloomington, Illinois. This invention relates to that class of milling machinery known as "dust-collectors," and it has for its object to provide simple mechanism for automatically supplying and cutting off an air-blast to the dust-chambers. Figure 1 is a broken sectional elevation of two dust-chambers placed one above the other. Fig. 2 a horizontal plane taken on the line x x of Fig. 1. In flour-mills dust and fine flour are constantly being thrown off from the bolts and millstones into the atmosphere, which not only renders the air unhealthy, but also deposits the dust upon the journals and running parts of the machinery, tending to choke the same; and the accumulation of dust in time increases the danger of fire, which is always more or less imminent in mills of this and other



classes. Referring to the drawings, the letters A A' indicate two dust-chambers placed one above the other. These dust-chambers are preferably constructed of circular form in cross-section, and are provided with a series of frames, over which are stretched cloth in such manner that as the air is forced through them the dust will be arrested and held by the cloths. These frames are of such well-known construction that no special description of the same will be needed. The lower dust-chamber is provided with a central air-passage, extending vertically through the center of the same and communicating at its lower end with the cloth-frames of said dust-chamber, and at its upper end with the dust-chamber A'. C indicates the air-trunk for conveying the dust-laden air from the bolts or millstones, the air being forced through the same by a fan, or by any of the well-known means employed for the purpose in this class of machinery, said air-trunk being connected with and discharging into the central air-passage, B, as shown. D indicates a shaft extending up vertically through the center of both the dust-chambers A and A', said shaft being rotated by connecting the same

by suitable gearing with any portion of the milling machinery. E indicates scraper-arms, rigidly mounted upon said shaft D, and revolving with a scraping action upon the bottom of the dust-chambers A A', sweeping the accumulated dust out through openings e, whence it is conveyed by a suitable hopper or troughs to bins or other receptacles designed to receive the dust. F indicates knocker-arms mounted upon said scraper-arms E, and provided upon their extremities with rollers f, which come in contact with inclined blocks or cams e' e', as shown in Fig. 1, secured to the under sides of the cloth-frames, and thus impart at each revolution of the shaft D a violent agitation to said frames, shaking the dust from the cloths that has accumulated thereon. In the present instance only two in-



PATENT NO. 309,078. DUST COLLECTOR FOR MILLS.

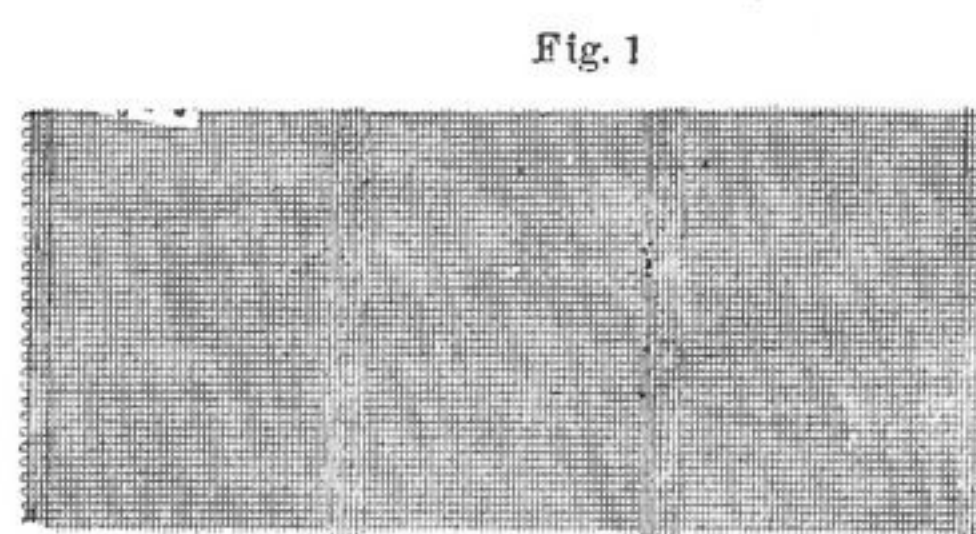


Fig. 1

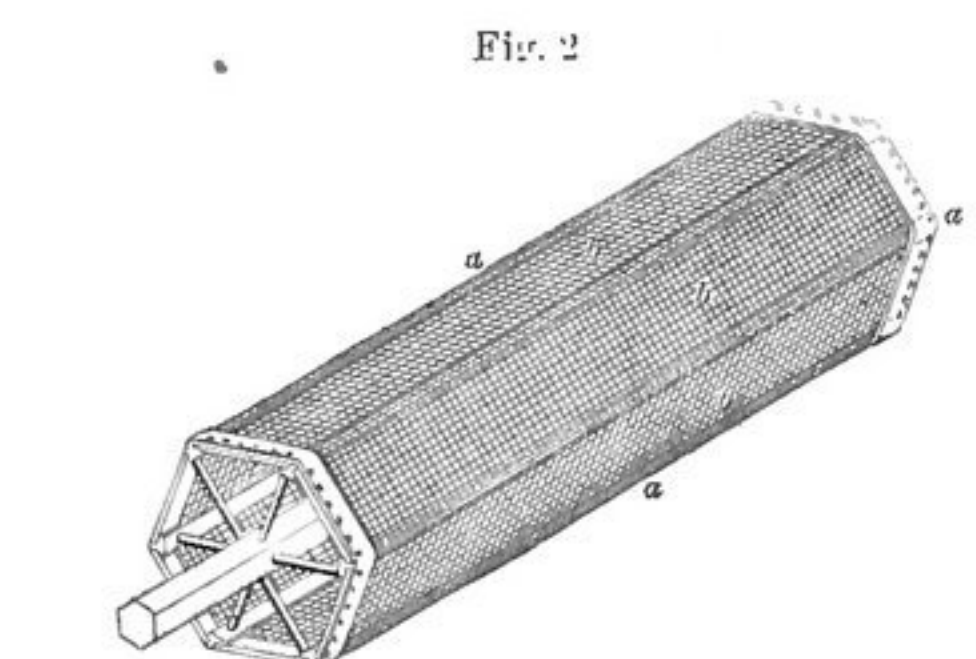
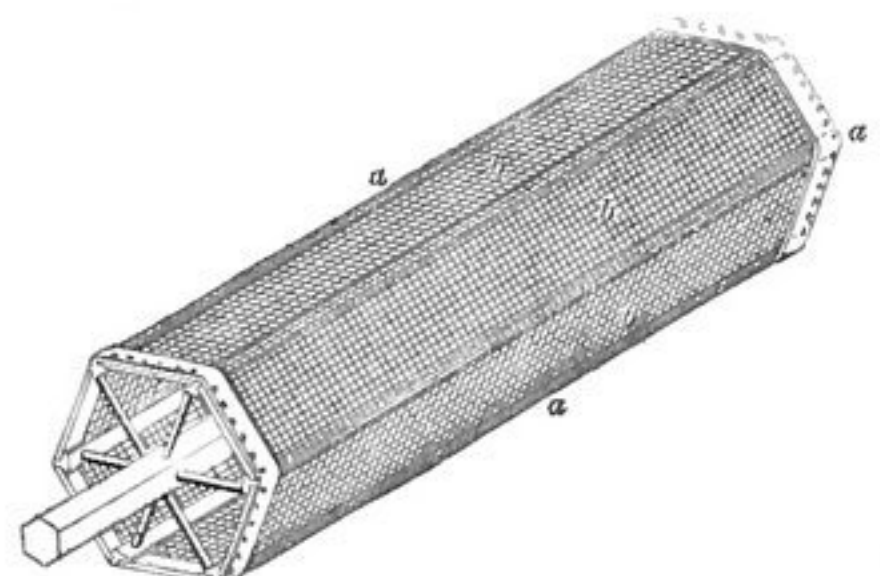


Fig. 2



PATENT NO. 309,102. BOLTING-REEL.

clined blocks or cams are shown to each collecting-chamber, but it is evident they may be increased to any desired number that may be found expedient, in order to give the necessary agitation to the cloth-frames by the spring knockers. In order to effectually dislodge the dust from the dust-cloths it is necessary that the air be alternately shut off from the dust-chambers, for the reason that if the cloth-frames in both chambers were all the time to be subjected to the blast the force of the blast would hold the particles of dust against the cloth, and in order to exclude the blast from one dust-chamber and allow the other chamber to continue separating the air from the dust an automatic device constructed and arranged as follows is provided. Within the central air-passage and at the discharge end of the air-trunk is placed a cut-off

valve. Said valve is rigidly secured to and moved with a rock-shaft, mounted in suitable bearings. Affixed to one extremity of said shaft is a crank, pivoted to a pitman, the other end of said pitman being supported in a horizontal position by a pivoted arm, as shown, or by bearings of any suitable nature. The pitman is provided with beveled recesses. k indicates a gear-wheel mounted in suitable bearings and provided with a roller wrist-pin, said gear-wheel being so arranged with respect to the pitman that the wrist-pin will alternately engage with the beveled slots in its rotation. Said gear-wheel, gears with a small gear-wheel, which is mounted on a shaft carrying a beveled gear-wheel, several times larger than the gear-wheel l, and the said beveled wheel gears with a beveled wheel, n,

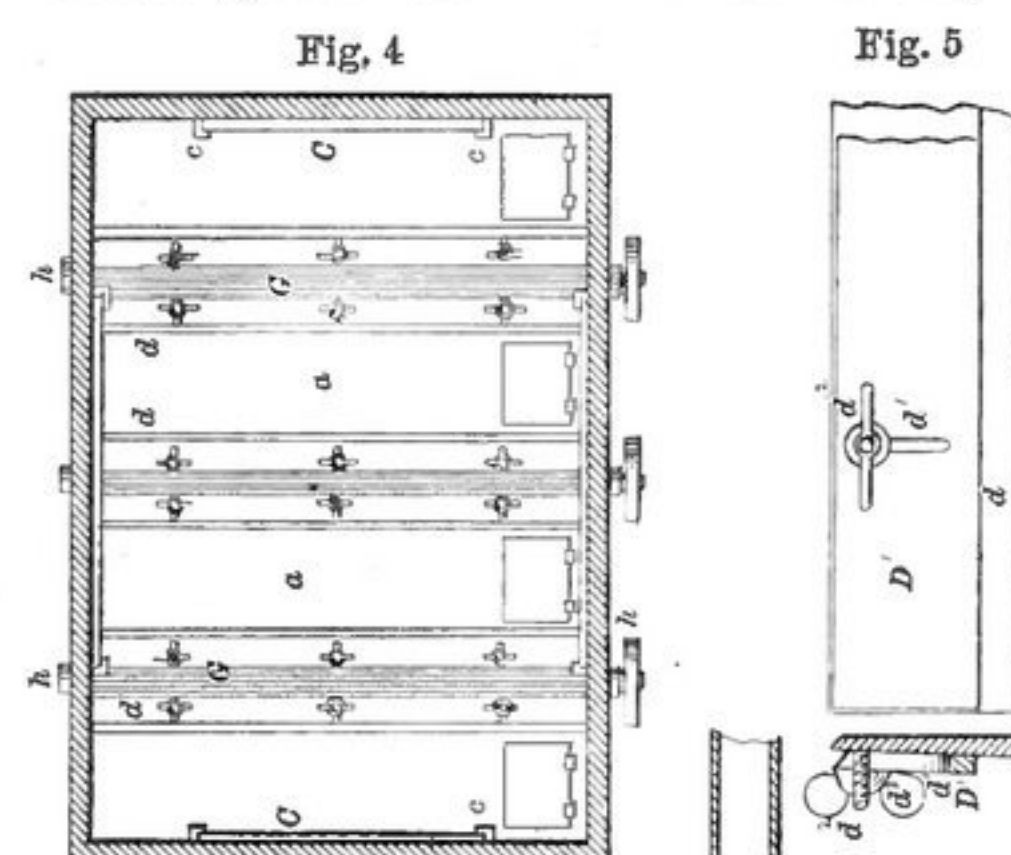


Fig. 4

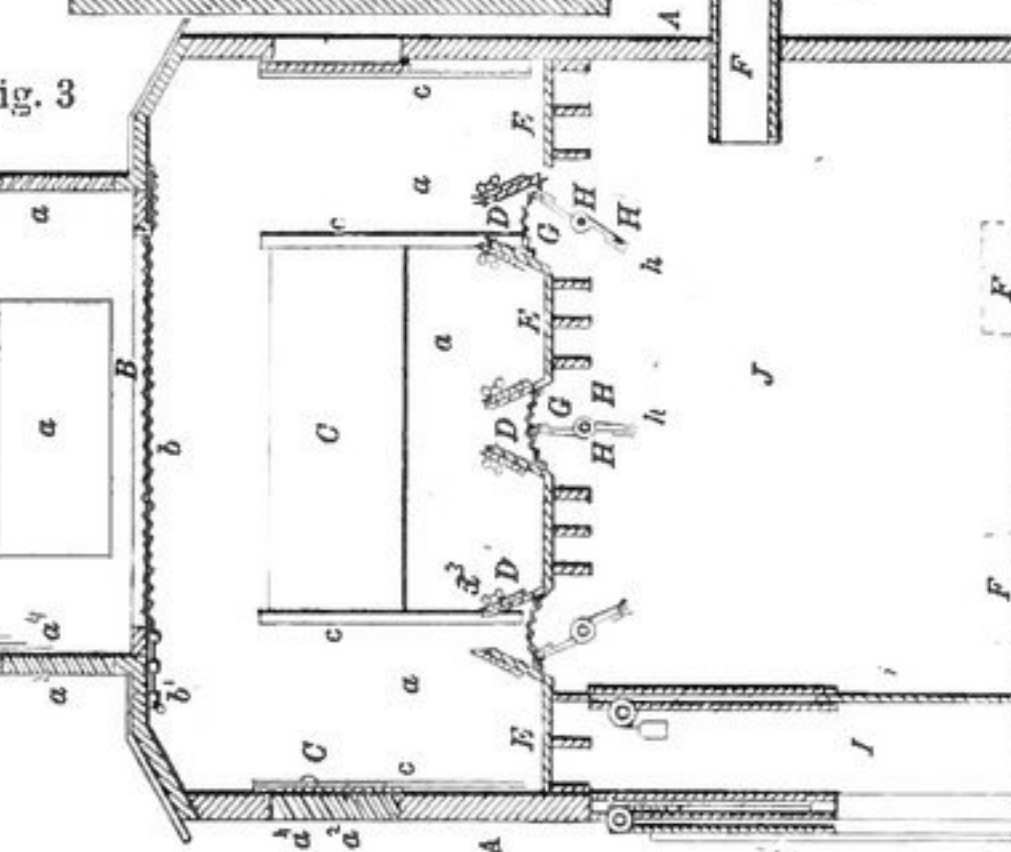


Fig. 3

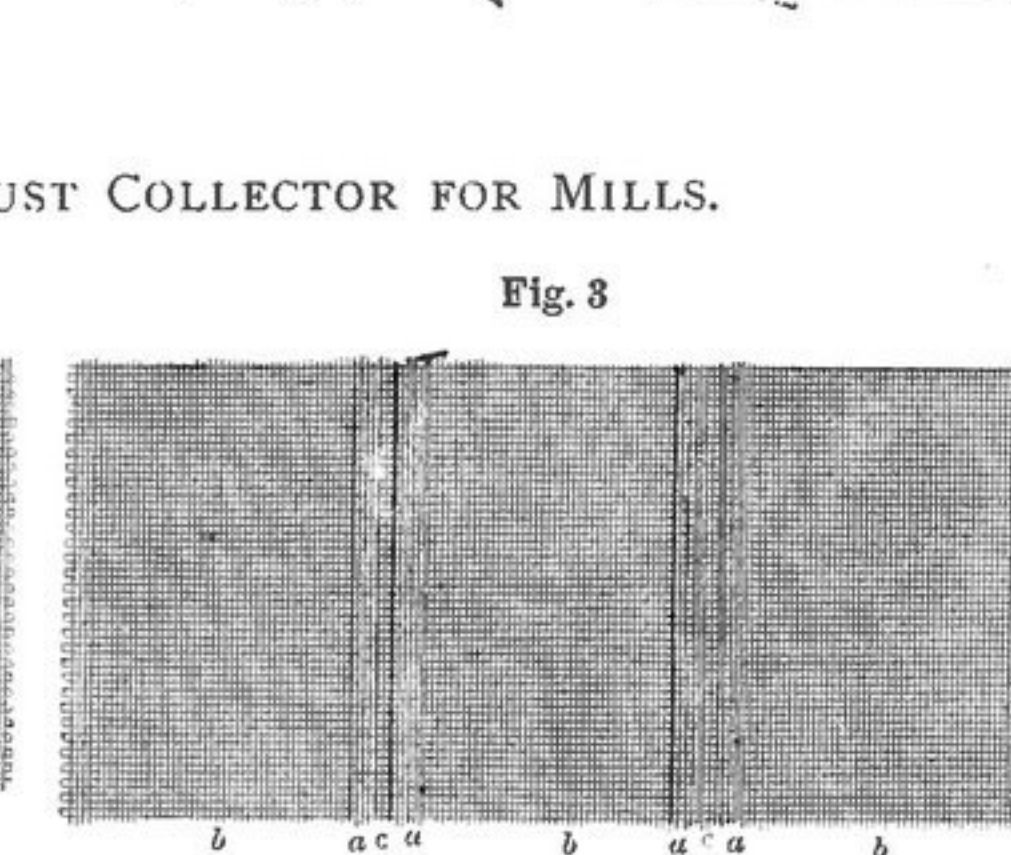


Fig. 3

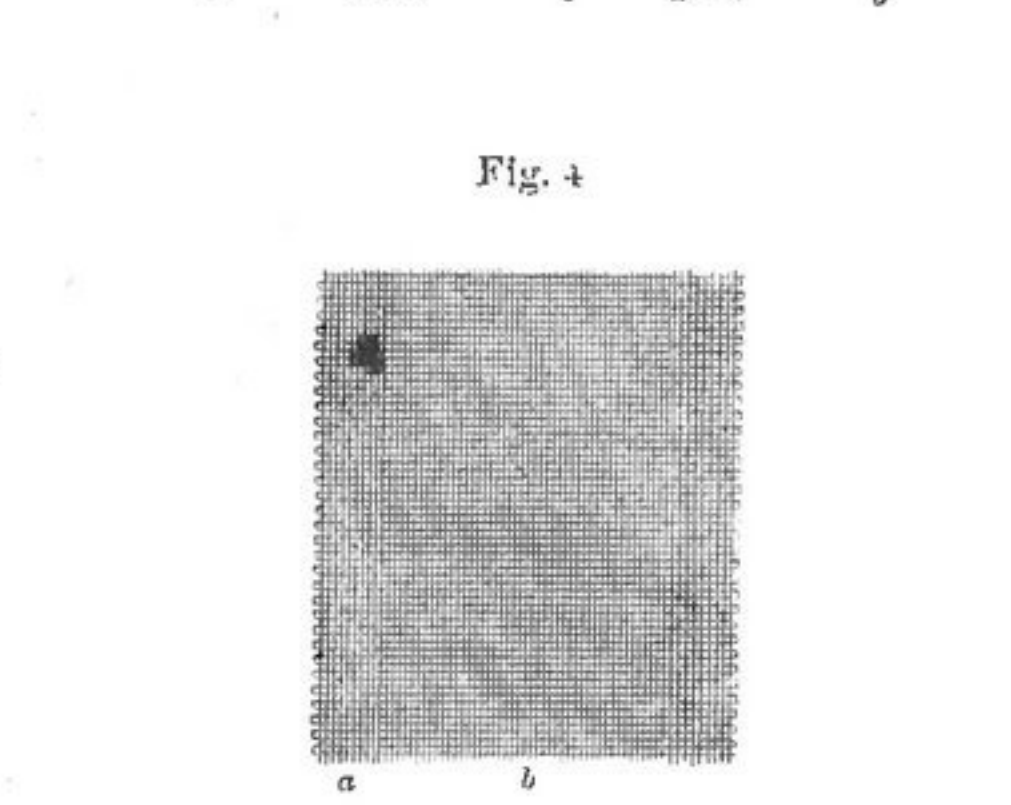


Fig. 4

mounted on the central shaft. The cut-off valve is operated as follows: The central shaft, being rotated, communicates motion to the wheel, k through the medium of the gearing described, said wheel revolving at a very slow rate of speed, and as the wrist-pin enters and passes through the beveled slot the pitman will be forced to the right, drawing with it the crank h and depressing the valve, so as to cut off the air-blast from the lower dust-chamber and direct it to the upper chamber. The rock-shaft is provided at one extremity with a weighted arm, (the weight not being shown,) to balance said shaft and the valve mounted thereon, so as to enable said valve to be turned with a small amount of power, and to maintain said valve in any position to which it may be turned. The knocker-arms in their rotation strike the cams on the lower portions of the

cloth-frames and dislodge the dust, and the air-blast being shut off from the lower chamber the dust descends by gravity to the lower part of the chamber, where it is swept off by rotating sweepers into the openings e, and is thence conveyed to the dust-receptacles. When the wrist-pin reaches the beveled slot j, the pitman will be forced to the left, thus raising the cut-off valve, shutting off the air-blast from the dust-chamber A', and discharging said blast to the lower chamber A. The blast is thus automatically deflected from one to the other of the dust-chambers at regular intervals.

DUST-COLLECTOR FOR MILLS.

Letters Patent No. 309,078, dated Dec. 9, 1884, to Charles O. Mook, of Jackson, Mich. This invention relates to that class of dust-collectors for flouring and other mills in which the dust-laden air is conducted from the separate machines or apartments of the mill to a dust-collecting chamber, where the air is sifted or freed from dust and permitted to escape. The invention is applicable to all classes of mills where it is desired to arrest or collect the dust arising therein. In the accompanying drawings, Figure 1 is a vertical section of dust collecting chamber embodying the improvements. Fig. 2 is a horizontal section thereof on line x x, Fig. 1. Fig. 3 is a vertical section of such a dust-collecting chamber embodying features not shown in Fig. 1. Fig. 4 is a longitudinal section taken on line y y of Fig. 3. Fig. 5 illustrates in elevation and section a detail of the blast-regulating device. The casing A is a rigid structure, which may be located in any convenient place—as, for instance, it may form a cupola at the top of a mill, or be an independent structure located adjacent to a mill. Arranged centrally at the top of the casing, and forming a part thereof, is a ventilating-chamber, the side walls of which are provided with ventilators, and across each of these ventilators is stretched a piece of reticulated cloth, such as is commonly used in devices of this character. Interposed between the ventilating-chamber and the main or dust chamber of the collector is a hinged frame, also clothed with reticulated cloth, and held normally in a horizontal position by a bolt, or other equivalent means. The walls of the casing are provided with ventilators, similar to but proportionately smaller than the ventilators described in connection with the ventilating-chamber A', and these ventilators are also clothed with reticulated cloth. Valves or gates are secured in proximity to these ventilators, and adapted to be moved over or away from the ventilators, to either prevent or permit of the passage of air-currents through them. In the drawings said gates are shown as mounted to slide in ways or guides, but it will be understood that the same object would be accomplished if they were secured by hinges at one edge or by a pivot bolt, it only being essential that they be adapted to be so moved as to cover or uncover the ventilating-openings, so that air may escape through them or not, as circumstances may require. At a suitable distance below the top of the dust chamber a are discharge-openings, or "nozzles," formed by inclined boards, arranged in pairs, as shown; and to the inclined sides of these nozzles are adjustably secured slide-boards, adapted to be moved upward to project beyond the mouth of the nozzle and decrease the width of the opening thereof. The inclined sides of the nozzles are provided with upwardly-projecting screw-bolts, which pass through transverse slots in the slide-boards, and serve as guides for said boards, the slide-boards being adjusted by hand and secured against movement after adjustment by means of thumb-nuts, fitted upon the bolts d'; but the slide-

boards may be adjusted and held by any of the many well-known mechanical devices used for similar purposes. The floor of the dust-chamber may be made hopper-shaped, horizontal, or a series of conveyers of any of the well-known forms may be arranged below the level of the nozzles, to receive the dust as it falls and conduct it to any desired receptacle. The operation of this dust-collector is as follows: The mill to which said collector is to be applied is provided at suitable points with the usual apparatus—such as exhaust fans and pipes—to collect the dust or refuse and conduct it to a common receptacle. In using this dust-collector these pipes discharge the dust-laden air-current upward through the nozzles into the dust-chamber, where, as the current is less confined, a greater part of the dust will escape from the upward current and fall below the nozzles. The lighter particles of dust will, however, be carried upward until arrested by the reticulated cloth of the hinged frame B. Where the air-current is too strong this fine dust will be pressed against the cloth of the frame until, eventually, the accumulation of fine dust upon the cloth will be so great as to prevent the passage of air. To overcome this objection the sides of the dust-chamber are provided with cloth-covered ventilators, through which a portion of the air-current can pass, one or more of the gates C having been first properly adjusted. It has been found that a portion of the very fine particles of dust will pass through the cloth on frame B into the ventilating-chamber, and to prevent the escape of this dust into the open air the ventilators a' are clothed with reticulated cloth. As there is a free circulation of air from the exterior of the building through this ventilating-chamber, the fine dust will not be apt to lodge upon the cloths in sufficient quantities to prevent the escape of air from the dust-chamber. This ventilating-chamber may be cleared of dust from time to time, as necessity requires, by withdrawing the bolt b', which sustains the hinged frame B, and permitting the frame to swing down on its hinges and the dust to fall into the dust-chamber, it being necessary, of course, during this operation to stop the fans in the mill, so that there will be no air-current to carry the dust against the cloths. In Fig. 3 is illustrated a modification of this

dust-collector, devised with special reference to the requirements of wood-working factories. G G are screens of wire-cloth, arranged across the nozzles D below their discharge-openings, to prevent shavings and the like from being carried up into the dust-room. It is preferred to mount below these screens horizontal shafts, carrying one or more radial arms, provided at their outer ends with brushes, which upon the revolution of the shafts sweep the under sides of the screens and remove such particles as are too large to pass through; but these shafts and brushes may be dispensed with. To avoid danger from fire, the bearings h, in which these shaft are journaled, are mounted at the exterior of the casing A, as are also the pulleys or gear-wheels which connect the shafts with the source of power. These bearings and pulleys are shown exposed to the atmosphere; but it will be understood that in practice they will be protected by suitable housings. The portion of the interior of the casing A below the screens G forms a shavings-room, which communicates by means of a sliding door, with one side of a fuel-room, at the other side of which is a similar sliding door, to afford communication with the furnace-room, or with a duct leading to said furnace room. Upon closing the door i' and opening the door i the blast from the pipes will carry shavings into the fuel-room, and upon closing said door i and opening the door i' the shavings may be taken from the room as required.

BOLTING-REEL.

Letters Patent No. 309,102, dated December 9, 1884, to Dietrich Schindler, of Zurich, Switzerland. This invention has reference to bolting-reels: In the accompanying drawings, Figure 1 shows a piece of bolting-cloth with two bands of plain close weaving, and the open gauze sections. Fig. 2 shows a reel covered with the same. The outer adjacent selvages may be sewed or laced together or fastened each to the frame. Fig. 3 shows a piece of bolting-cloth with the bands of plain close weaving arranged in pairs, and a narrow line of gauze or open weaving, between the bands of each pair, along which the cloth can be easily severed. This open space may be formed by the weft. Fig. 4 shows a piece of bolting-cloth woven

narrow with the bands at the sides. The bands and selvages, either or both, may be made of other material than the body of the cloth. For instance, they may be woven of much coarser and stronger material. The number of bands may be varied to suit the demands of the trade; also, although the bands are preferably woven close, yet it is within the scope of this invention to weave them with the same open mesh as the body of the cloth; only in this event coarser and stronger threads must be used for the bands to give the necessary strength; but in all cases the bands run lengthwise of the cloth, and are made wide enough to admit of being used for the purposes of attachment to the ribs of a reel.

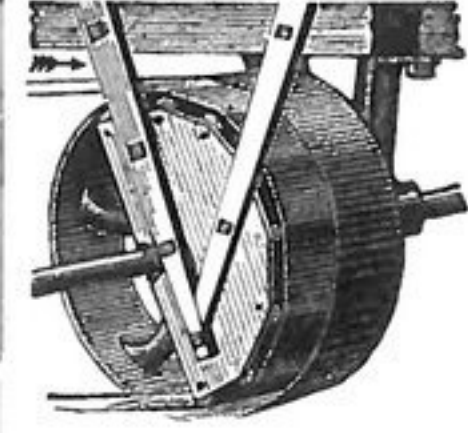
A company with a capital of \$50,000 has been incorporated at Louisville, Ky., for the manufacture of corn meal and hominy.

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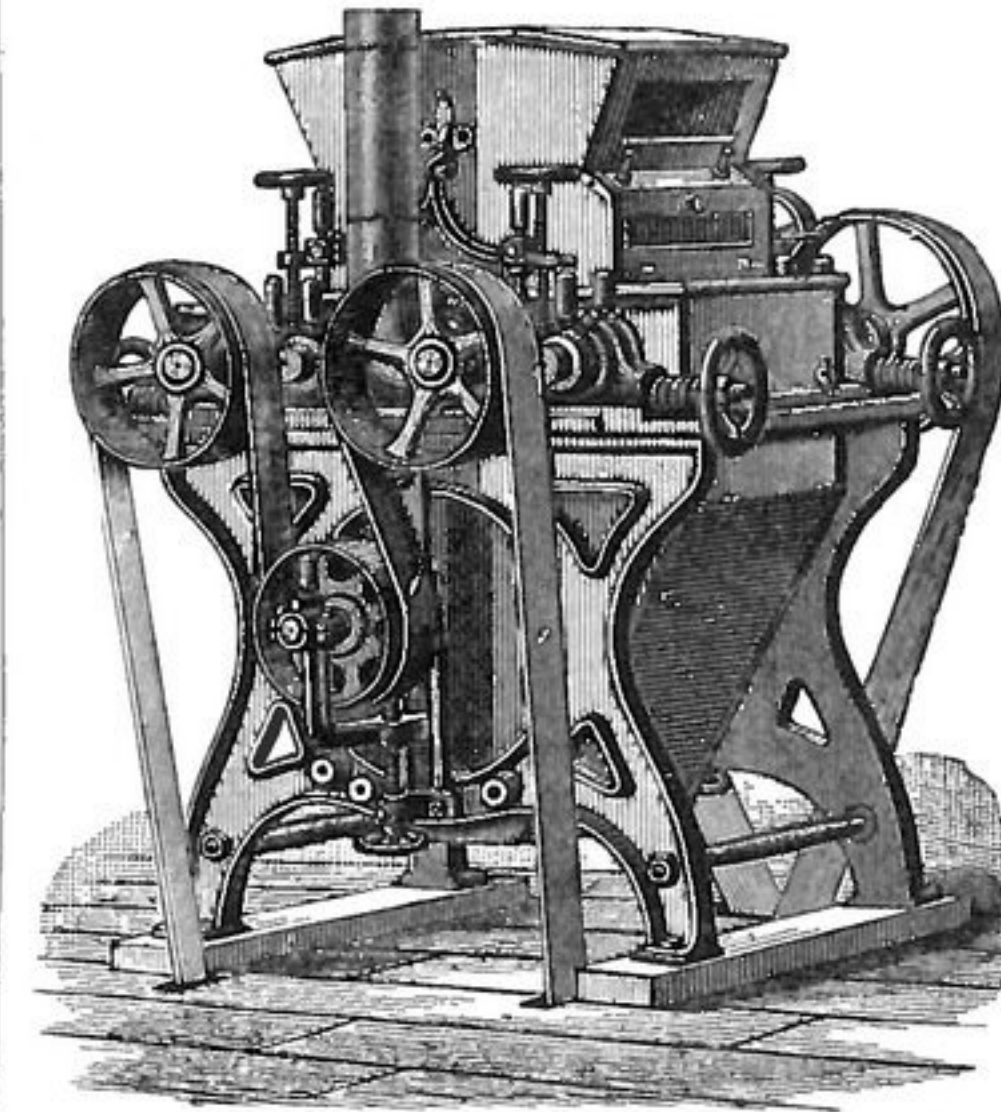
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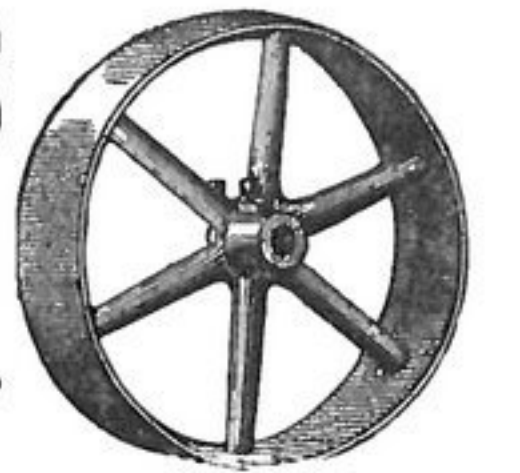
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LUBRICANTS.

LUBRICATING oil is so important a factor in the successful running of machinery, and the tests and experiments made at different times and in different countries have been so manifold, that it seems their value should be established with the greatest scientific accuracy. A discussion held on the subject at the recent meeting of the Society of Mechanical Engineers, rather contradicts the assumption and tends to prove that many more investigations are necessary to establish a correct knowledge about lubricants. Dr. Arvine, analyst of the Standard Oil Company, gave a series of valuable facts, bearing upon this question, which deserve the widest possible circulation among the users of machinery, and from which we give the following abstract: To a practical man, who wants to know what he needs to put upon his engine, the value of the "coefficient of friction" is extremely important. We know perfectly well that it depends upon many conditions that are difficult to maintain and to understand. Even the wisest admit that there is very little yet found out which throws practical light upon this subject. For instance, we know perfectly well when they decide the coefficient of friction of paraffine oil on two polished surfaces made to fit perfectly, we gain no light at all on what is needed on bearings that do not fit equally well, or have the same finish. If we are to decide how to construct a bearing, what its proportions would be, how large a segment it should cover, all of these researches would be directly to the point. But if we have an engine that runs hot, or a certain construction of bearings that makes it difficult to find a suitable lubricant, these investigations afford us no light whatever. Crediting all possible value to researches regarding coefficient of friction, what we most want to know is vastly beyond that. For instance, an engineer comes and says, "I was using such a paraffine, and my engine ran cold. I am now using such a paraffine and my engine runs hot." We find on examination that there is no practical difference between the two, but when we come to apply them to a bearing we find that for some reason the oils do not work alike. When we apply them to spindles we find that two paraffine oils often bear no relation to each other in their practical behavior. We find that one will run at a much higher temperature, for some obscure reason. We might think it due to velocity, but we find by our instruments that it does not depend upon that. In some instances, too, the results we obtain are exceedingly contradictory. The Rochester & Pittsburgh Railroad Company run their cars with a bearing the surface of which is composed, apparently, of lead—it appears to be lead spread over the inner surface of the composition box, which looks as though it might be gum metal. They say they can run an oil on this soft bearing that I know positively fails under similar circumstances and on the same class of cars on the New York, Lake Erie & Western, the New York Central, and the Delaware & Lackawanna—just why, I cannot say. A shaft will sink down in that bearing, and yet it runs cold, and runs on a very cheap oil.

One of the oil companies manufactures an oil which is composed largely of a mineral base united with fatty acid. All things considered, that oil has been the most successful for running cold of any oil used on railroads. And yet that fails to equal some cheaper oils on the friction testing machines. We have lately made comparative tests on fast-running Sawyer spindles,

We have half-a-dozen oils from Europe, and several made in this country. Adapting a dynamometer to this I expected to find that oils having the best body would be the best oils for these spindles, but I found that I did not know anything about it. After having read many papers and listened to a great deal of talk from gentlemen who know a good deal about it, I found that the spindles did not bear out anything I expected. A spindle that was nicely fitted behaved in one way, but a spindle that was badly fitted behaved very differently. The effect of this was to establish a friction of its own, in addition to the friction we generally speak of as due to the oil itself. If we put on oil that has a good body the heat increases very rapidly. Now, we say at first that that was an objection to that oil. But we found, after running them for a short time, that the oils which gave us the best results in the economy of power, were the ones that produced the most rapid wear. We found after running constantly at some 6,500 revolutions a minute, that it lost as much as one-tenth of one gramme in actual weight. When we took another paraffine oil the wear was not half that, and there seems to be no apparent reason for it. One reason why these Sawyer spindles ran so well was that they run in a flooded bearing. The question of wear on bearings, as ordinarily found, is more important than the cost of oil. One large mill owner came recently and said he wanted an oil for his spindles. He did not care what it cost so long as it was efficient, for after running eleven mills for many years he had discovered that so great loss was sustained from wear due to poor lubrication as to make the mere price of oil unimportant.

We generally find that where we can use oils of higher viscosity ordinary machinery bearings run colder; but in some instances of high speed and heavy pressure only thin oils answer at all, and the bearings must be flooded. With bearings nicely finished, and journals carefully scraped and ground to fit, an abundant and constant supply of thin oil will give the best possible result in keeping the bearings cold and saving power. With such machines you may learn much of the proper proportions of bearings and of the conditions of friction in relation to pressure and speed; of oils, too, under the exact conditions of these machines, but nothing of the requirements of machinery in common use. Some experimenters think of a journal and bearings as two cylindrical surfaces in perfect contact. It would be more scientific and practical to regard the fit of ordinary bearings like that of a pea in a bushel basket. In many instance, one point of contact would be too much to expect, and the body or viscosity of the oil must make the fit.

The results of testing oils in testing machines do not correspond to the practical workings of these oils. In order to obtain the exact data an engine oil should be tried on an engine, spindle oil on a spindle, and wagon grease on a wagon, all as nearly as possible under the ordinary conditions. It is frequently said that we have petroleum oils which alone answer all requirements of lubrication. It is not so. Practical experience fully proves that in many instances compounded oils are best. Sometimes a thin petroleum oil, with a small portion of animal oil, gives better results. There are instances where the best petroleum oils do not answer on an engine, when lard oil, or a mixture principally lard oil, keeps the engine cold and in every way satisfactory. This is sometimes the case whether the petroleum be of heavier or lighter gravity than the lard oil. But these are rare instances where petroleum oils do not answer every requirement.

* * Where boilers are found to be badly corroded and pitted, internally along

the water line, says the Locomotive, and covered with a heavy deposit of sediment baked on hard, either through bad practice in blowing off boilers while the settings are still red hot, or through the action of overheated flues, the best method of preventing further mischief is to send a man inside the boiler and thoroughly scrape the shell, getting down to the sound iron. This may very likely take two or three days. Then with a stiff wire brush thoroughly oil or paint the corroded portion with red lead and boiled linseed oil. Two or three applications may be sometimes found necessary to accomplish the desired effect.

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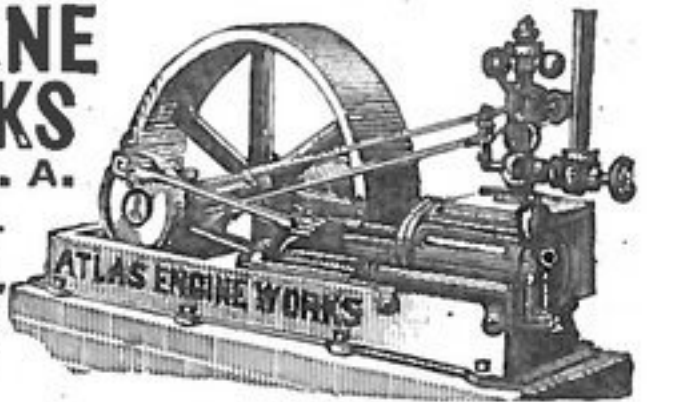


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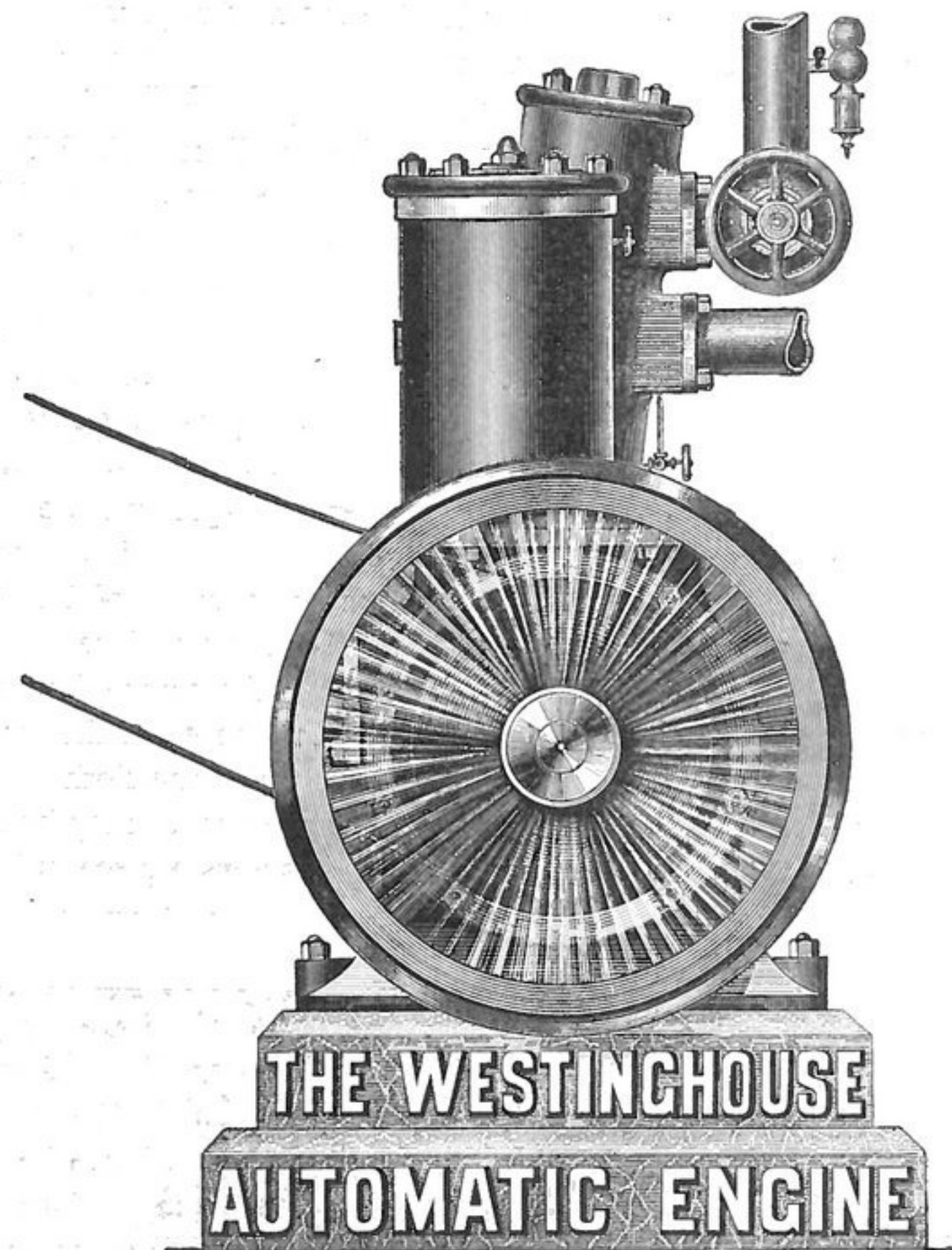
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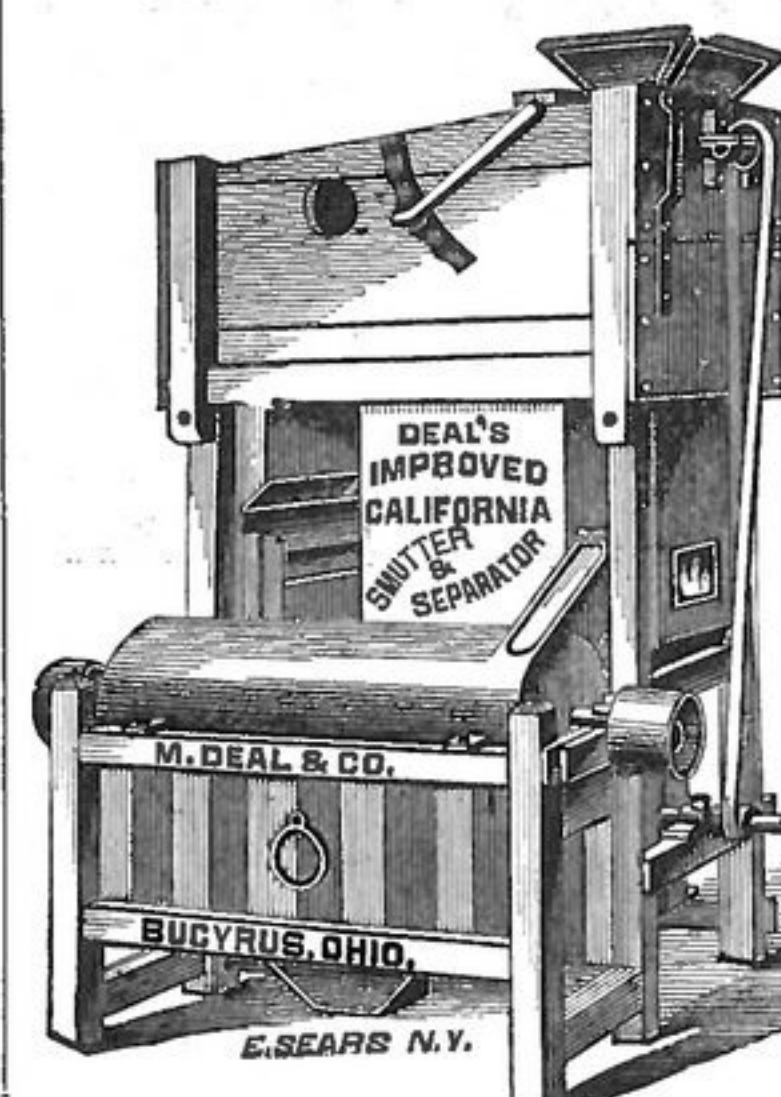
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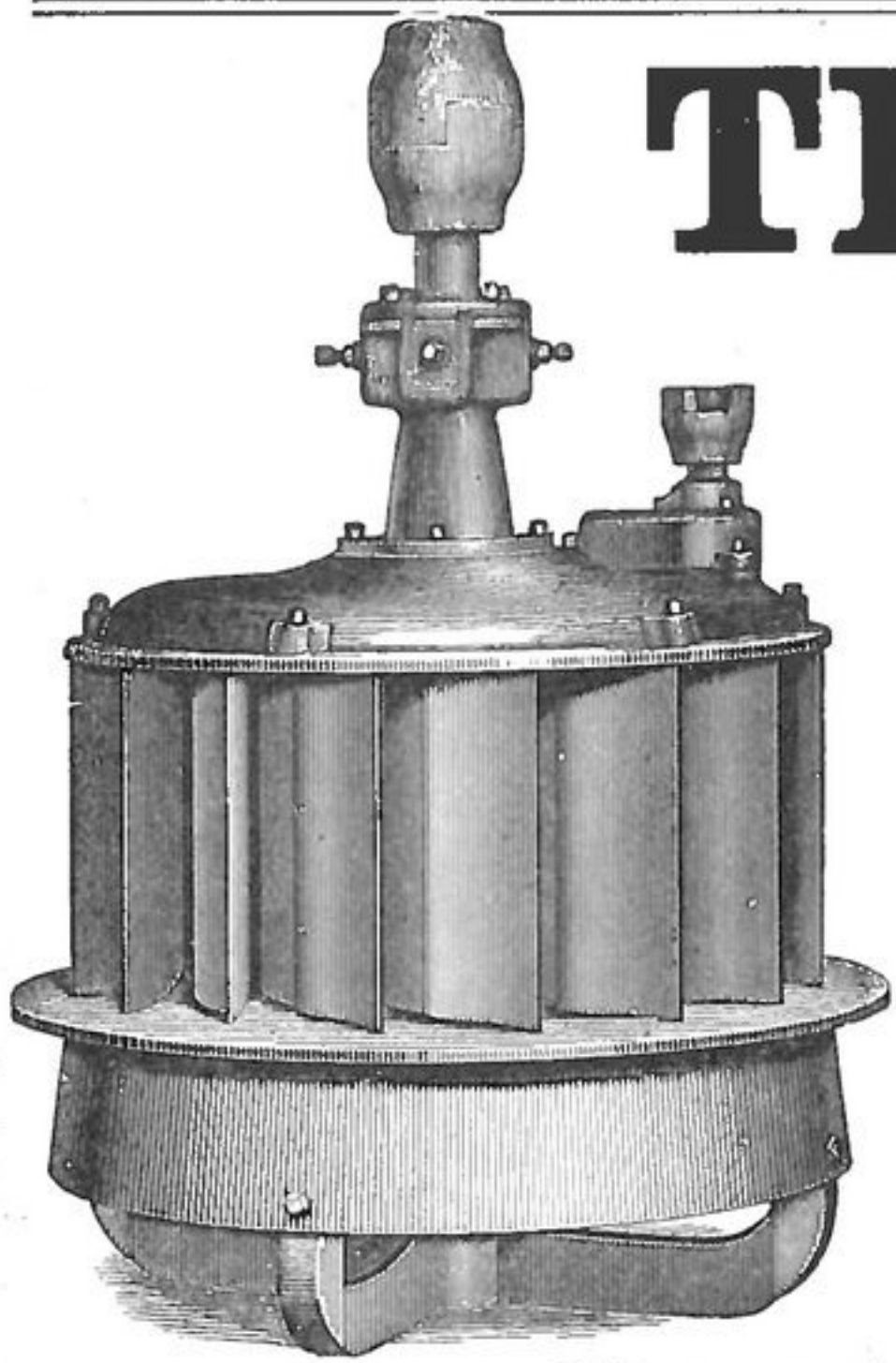
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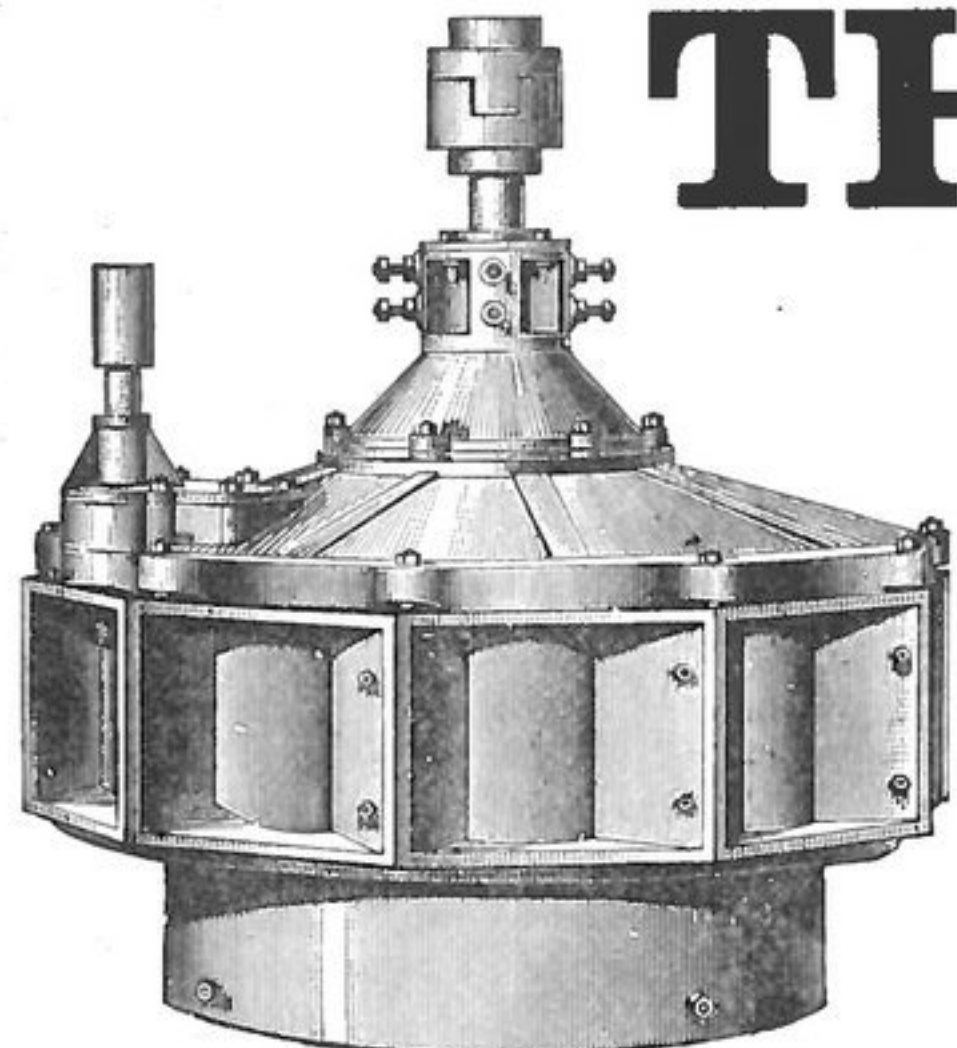
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24 Inch Wheel.	.8206	.7910	.7700	.7008
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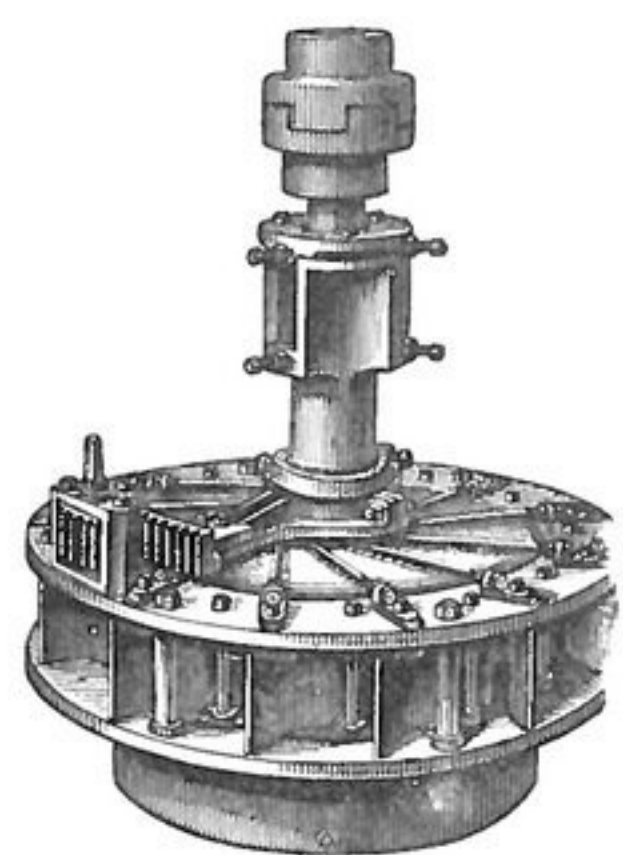
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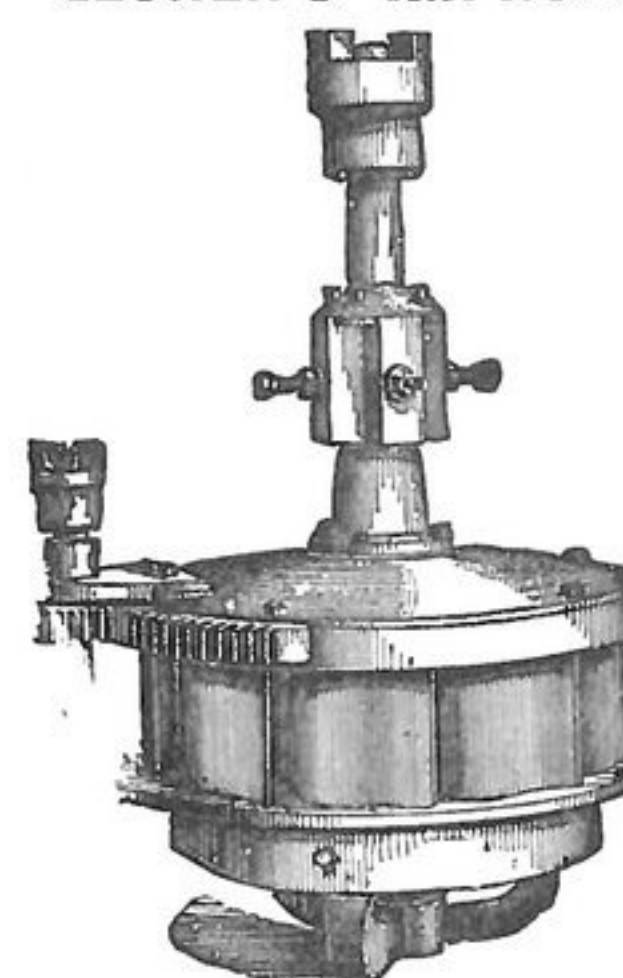


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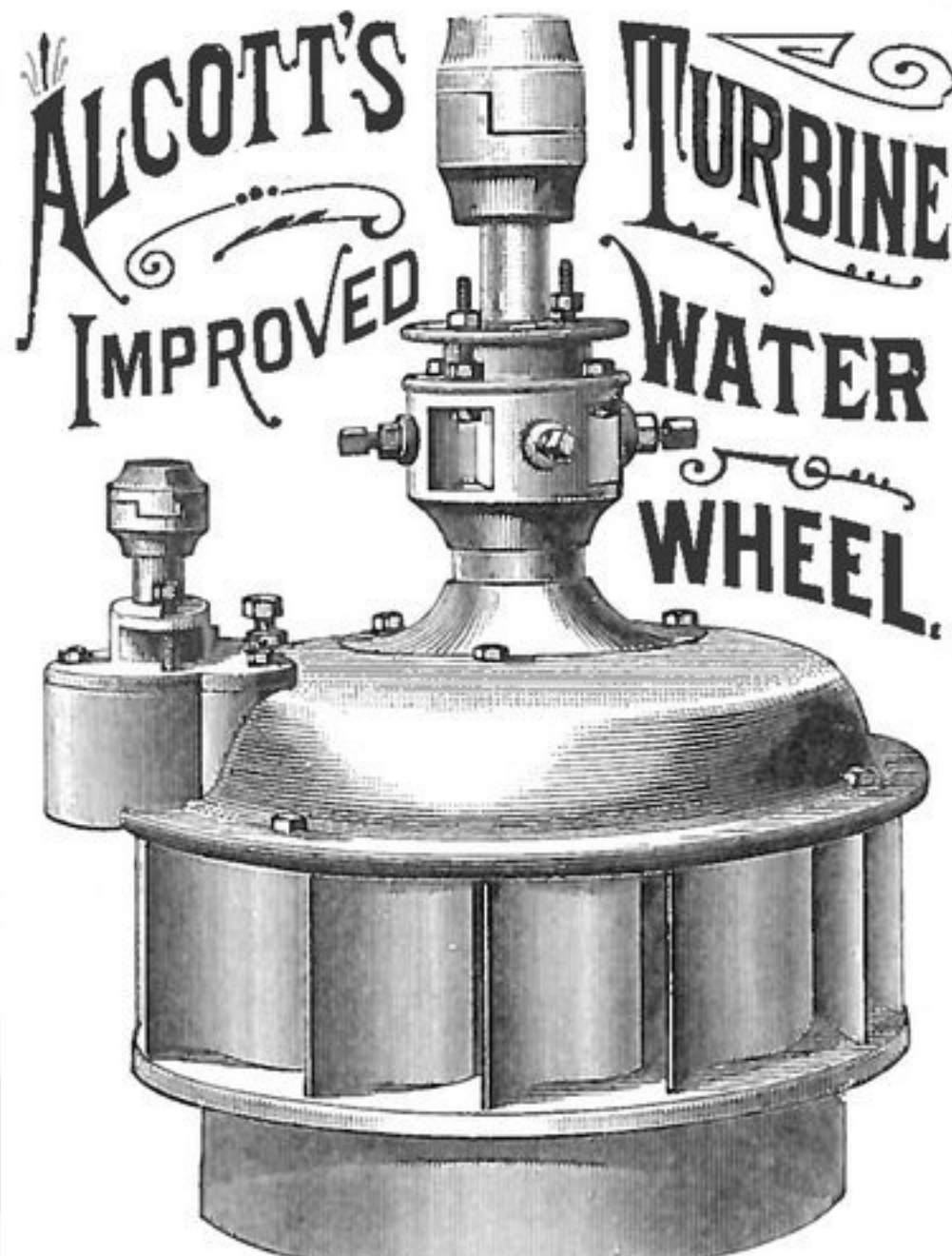
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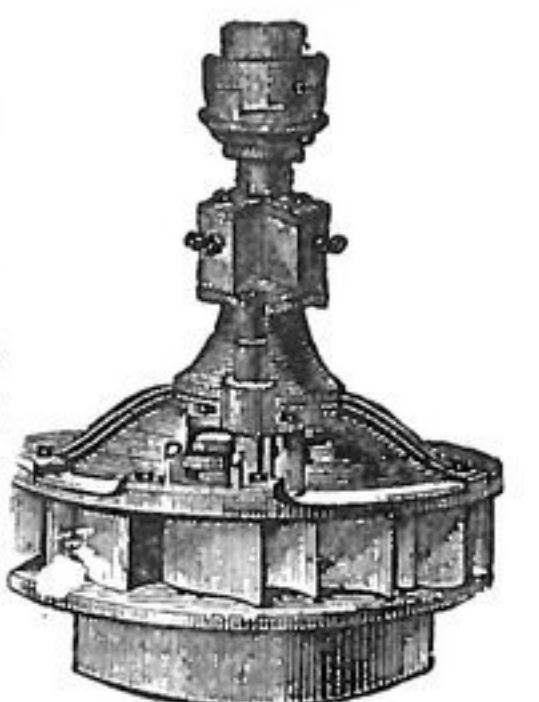
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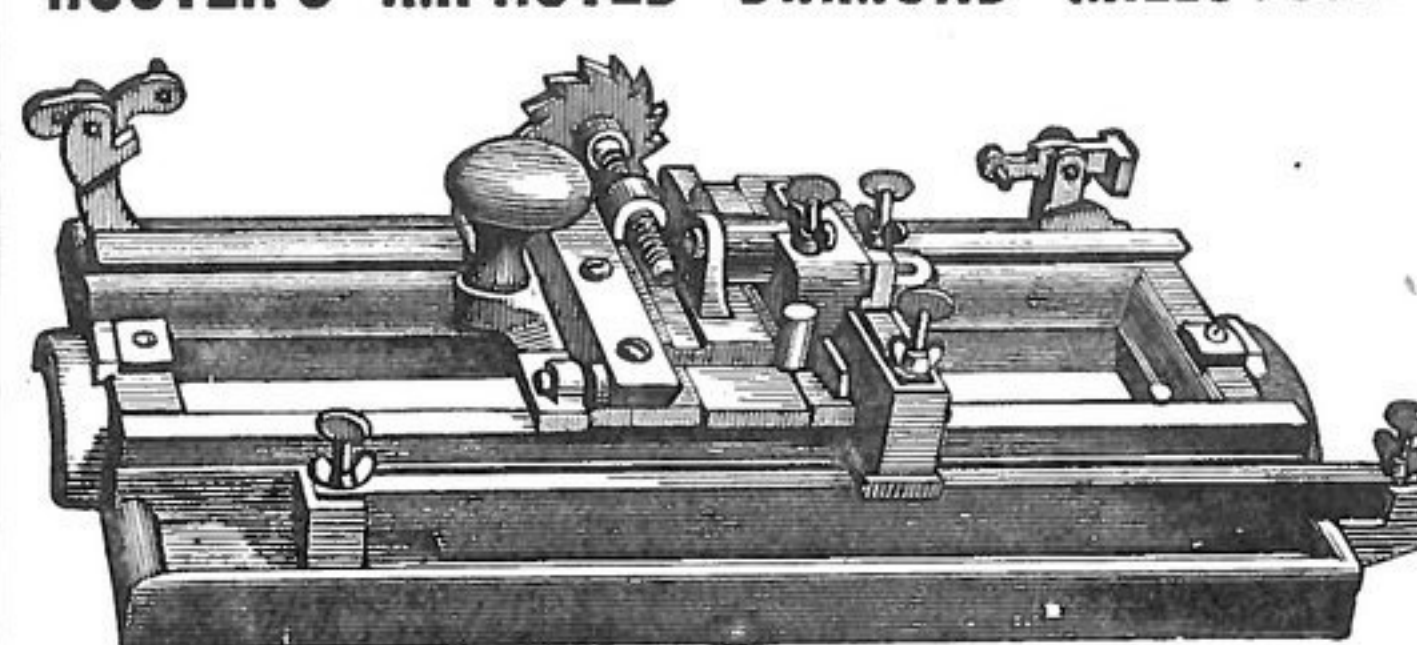
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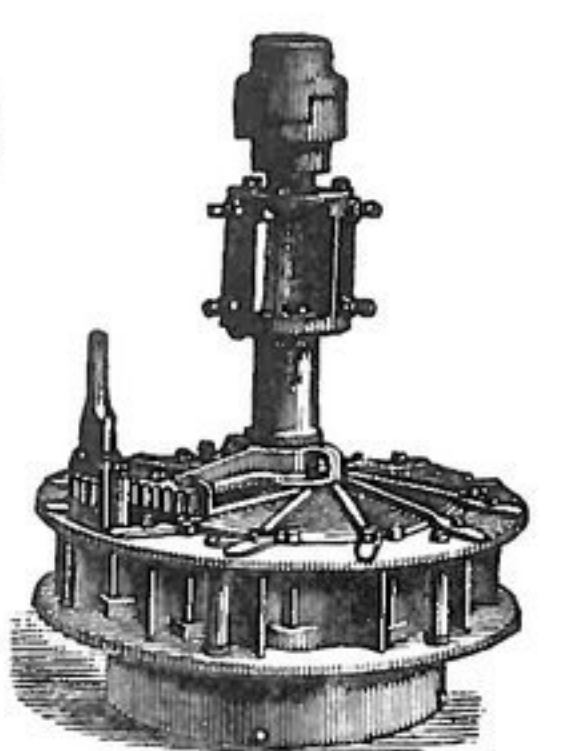
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Notes from the Mills.

J. E. Rose, Kingston, Tenn., will build a grist mill.

T. B. Anderson is building a new mill at Brambleton, Va.

John Purser, of Cochran, Ga., recently burned out, is rebuilding his mill.

Mr. Lane, of Claremont, Va., has commenced building a new grist mill at that place.

Dickson & Green, Comanche, Tex., have about completed their \$16,000 roller flour mill.

The flour mills of R. H. Dulaney, at Middleburgh, Va., are to be enlarged and improved.

Stewart Brothers, millers, at Atlanta, Ga., have been burned out. Loss, \$12,000; insured for \$5,000.

Incendiaries touched a match to Dole's flour mill at Dodd City, Texas, on the 7th ult. Loss, \$8,000.

Griffin & Morris, of Pickens, S. C., will erect a flour and grist mill, to be run by a 40 horse power engine.

The Hoople mill at Sauk Centre, Minn., was destroyed by fire Dec. 17. Loss, \$15,000; insurance, \$10,000.

Wilson & Beardsley, millers at Huntington, W. Va., have made an assignment. They claimed a capital of \$30,000.

The Case Mfg. Co., Columbus, Ohio, have a cablegram for three purifiers from A. B. Childs & Son, London, England.

Ed. Fulton & Co., Aberdeen, Ky., have purchased the Aberdeen Flour Mills and put in a large amount of machinery.

Geo. N. Williams, of Coulton, Ky., has rebuilt and started his grist mill, which was destroyed by a boiler explosion some time ago.

At Conyers, Ga., Dec. 9, Hon. W. L. Peck lost his fine flouring mill by fire. Lost about \$6,000. It is supposed to have been set on fire.

Douglas Bros. of Nashville, Tenn., contemplate changing the Shamrock mill to the roller system. This will give Nashville five roller mills.

N. S. Maitz, Greenwood, Ind., is making some changes in his mill, and putting in machinery furnished by the Case Mfg. Co., Columbus, O.

Gray & Fisher, Lawrence, Mich., have placed an order with the Case Mfg. Co., Columbus, O., for breaks, rolls, scalpers, bolting chests, etc.

I. J. Green & Co., of Hawkins, Texas, have bought the site of the E. J. Shamberger Mill, recently burned, and will build a new mill thereon.

Included in the Dakota Exhibit at the New Orleans World's Exposition is a miniature working elevator eight by ten feet, with glass sides and roof, which cost \$1,200.

On Dec. 10 the grain elevator of J. W. Price, at Bishop's Station, Ill., on the Wabash road, was destroyed by fire. There were 2,000 bushels of grain in the house.

A. B. Walker, dealer to grain and general merchandise at Cherokee, Kan., has failed. He has been trying to sell out for some time past. He has a capital of about \$10,000.

W. P. Gilbert, of Clifton, Tex., has decided to build a 125-barrel roller mill to run by water power. The building will be of stone. He is looking around among the mill builders.

At Waterdown, Ont., Dec. 11, the flour mill of John Forstner was burned, and about 1,000 bushels of grain consumed; loss about \$4,000; insured in the Citizens', of Montreal, for \$1,500.

W. T. Pyne, Louisville, O., has placed an order with the Case Mfg. Co., Columbus, Ohio, for one pair rolls, with patent automatic feed, to be shipped to W. M. Green, Charlestown Ind.

Some people at Chicago are still doing a large business in produce. For instance, one firm there paid out about \$80,000 on drafts in one day alone, and sold altogether about 2,000,000 bushels cash wheat during last month.

The Case Mfg. Co., Columbus, O., have been awarded the contract of S. E. Dewy, Waterford, Pa., for a full line of breaks, rolls, purifiers, centrifugals, bolting reels, &c., for a complete gradual reduction mill on the Case system.

The Case Mfg. Co., Columbus, O., have been awarded the contract of W. J. Lampkins, Owensboro, Ky., for breaks, rolls, purifiers, centrifugals, &c., for a complete gradual reduction mill on the Case system, using 12 pairs of rolls.

Mississippi has 101,772 farms; 14,456 are under twenty acres, the rest more than thirty. The average size of the farms is 156 acres. The state has 46,000,000 acres of land—value of farms and farming implements about \$100,000,000.

The Case Manufacturing Co., Columbus, O., have secured the contract of L. C. Lillard & Co., Marion, Ind., for a complete line of breaks, rolls, purifiers, centrifugal reels, bolting chests, etc., for a full gradual reduction mill on the Case system, using fourteen pairs of rolls.

The citizens of Charlotte, Tenn., have organized a stock company to erect and operate a flouring mill in that place. They intend to purchase the latest and most improved machinery, and will employ a competent miller to take charge of it. They will, we are told, begin the erection of a suitable building at once.

The wheat receipts bulletined at Milwaukee, December 16, were the heaviest for any day since 1877. Including the "through shipments"—93,000 bushels—they amounted to 316,000 bushels, and brought the stock in store there up to 2,743,931. The general opinion is that a few more days will see the commencement of a falling off in the movement from the interior.

The pressure for room in the Chicago elevators is being generally felt. The mixers and cleaners are ordinarily the best buyers for samples of wheat that are only just below the line of a grade. As they now experience difficulty in getting their grain into store they are not buying much, and sample wheat has declined in price very much more than wheat in store.

John O. Foering, grain inspector of Philadelphia, who is on a tour of inquiry through the west, as to the quantity and quality of cereals subject to shipment, reports that the only No. 2 red wheat received at Philadelphia this year, which graded, came from Ohio and Indiana. He also says that this year's corn crop is the largest in four years, and the best in quality.

A year ago the supply of wheat in sight was 37,731,928 bushels, or an increase from the previous week of 3,676,359 bushels. Of corn there were 8,875,603 bushels, or an increase of 533,808 bushels from the preceding week. Oats 5,808,053 bushels, an increase of 7,305. Prices were then higher than now, viz: No. 2 red at \$1.14 $\frac{3}{4}$ @ 1.16 $\frac{1}{4}$; No. 2 corn at 64 $\frac{1}{4}$ @ 66 $\frac{1}{4}$ c., and oats at 40 $\frac{1}{8}$ @ 40 $\frac{3}{4}$ c.

Edward W. Seymour, flour exporter and commission merchant at No. 43 Water street, New York, made an assignment Dec. 18, to Wm. W. Goodrich, given preferences for \$3,903. He succeeded to the export business originally established by his father under the name of Seymour & Mankowsky. He gave this up in 1874 and started again in July 1883. He claimed a capital of \$15,000, and was export agent for J. W. Kaufman, of St. Louis. The failure is attributed to shrinkage in values and dull trade.

Exports of wheat and corn, including wheat in flour, from all American ports from Sept. 1, 1884, to Dec. 6, 1884, and the same time previous years are as follows:

	Wheat, bu.	Corn, bu.
1884.....	37,727,000	4,790,000
1883.....	34,303,000	13,458,000
1882.....	49,000,000	1,716,000
1881.....	38,191,000	12,291,000
1880.....	52,997,000	27,078,000
1879.....	73,015,000	19,037,000

Edwin F. Smith, Secretary of the State Board of Agriculture, of California, in his official report just issued shows the State to lead all other states in the Union in wheat production for 1884. In his statement he shows the acreage sown to wheat to be 3,587,864 acres; and the average yield per acre 16.4 making a total yield of 57,420,188 bushels. This is the largest crop of wheat the State has ever produced. The largest crop prior to this was that of 1880, when the State raised about 50,000,000 bushels.

The Assistant Secretary of the Treasury at Washington, gave hearing to a committee representing the American Bagging Association and millers of Minnesota with reference to the drawback of flour bags and cotton bagging, on Dec. 11. Payments of draw-backs on the same, has been suspended on the ground that persons heretofore making draw-back entries were Custom House brokers who had no direct interest in business, but who collected claims and consolidated them in their own name. The committee represented that unless the former system of allowing draw-backs was resumed, it would cut off draw-backs altogether.

A rumor among grain men recently to the effect that the Chicago & Pacific Elevator Co. were negotiating for the erection of a storehouse with crib room for 1,000,000 bushels of wheat was partially confirmed by Mr. W. H. Harper, the company's manager, who on being questioned, admitted that the matter was being talked of, as they could use a good deal more room for their

heavy receipts from St. Paul, but no details were open at present to the public. This, it is said, might not be welcome to the trade in general, who are hoping for higher prices but cannot see any hope for them until the load has stopped increasing. There are now about 11,000,000 bushels of wheat in the Chicago elevators.

The Case Mfg. Co., Columbus, O., in a note just received make quite a cheerful report considering the generally admitted prevalence of dull times with machinery and mill furnishing men. They say "We have lately furnished our iron, and about two-thirds of our wood-working departments, with gas so that we are able to make full hours every day, and we are pleased to report that our trade still demands a full days work by a full force of workmen. Our order book for this day shows orders for three gradual reduction mills complete with our entire line of machinery. One of them is from Nebraska, one from Kentucky, and the other from Pennsylvania. These with the several smaller orders that dropped in make a good report for one day in mid winter. We see no chance to lay off any men or shut down a single day except strictly holidays this winter. In anticipation of a large trade the coming year we are making extensive additions to our work."

While the ambitious Territory of Dakota is clamorous for admission into the Union and thus taking upon itself the heavy cost of a State Government, its inhabitants, we notice, are croaking about the hard times. The low price of wheat has pinched the farmers, and as a result the business men in the towns are unable to make sales and to meet their liabilities. To illustrate: One farmer had an entire section in wheat and got from it an average of twenty bushels to the acre. That made 12,800 bushels. He netted about 47 cents a bushel, or, in round figures, \$6,000 for his crop; but it had cost him \$8 an acre to make the crop, or \$5,120. Then he had some commission to pay, so that he actually came out behind, counting nothing of his own time or for interest on the value of the land. Again: Twelve per cent is the legal rate of interest in Dakota, but as much as eighteen is charged. The settlers cannot meet their interest this year, and the State is receiving a severe set back in consequence.

The Manitoba, Duluth and Northern Pacific wheat shipments have been very heavy for several weeks past. In consequence of the large receipts at Duluth, the elevator capacity (about 50,000,000 bushels) is rapidly filling up. This has caused no little trouble, and arrangements are now making to prepare temporary storage for the large amount yet to arrive. The remaining capacity is not more than 1,250,000 bushels; and a sufficient amount is now on the road to reduce this at least 700,000 bushels. The Manitoba has 700 car loads, or 350,000 bushels; the Duluth 500 cars, or 250,000 bushels, and the Northern Pacific several hundred more car loads, on the road to Duluth. Yesterday the Manitoba gave orders to its agents to ship no more wheat to Duluth. It will take about two weeks to unload the cars now en route, and in the meantime all the Manitoba's wheat will be taken to Minneapolis. Several officials of the roads interested will visit Duluth to-day for the purpose of providing the needed extra storage.

The Case Mfg. Co., Columbus, O., have been awarded the contract for the remodelling the New Era Mills of Nashville, Tenn., to the full roller system. This mill when completed will be one of the largest and most complete mills south of the Ohio river. It will contain thirty-four sets of rolls, most of which are 9x30, also thirty-nine reels and scalpers, nine purifiers, and other machinery necessary for a complete four hundred barrel mill. This is the second mill built by the Case Mfg. Co. in Nashville. Mr. E. T. Noel's mill of three hundred and seventy-five barrels capacity, having been in successful operation for about two years. There was a sharp competition between the roll men to get this contract, as the city of Nashville is the most important milling center of the South. The awarding of the contract to the Case Co. together with the numbers of mills they are now building in Tennessee and Kentucky indicates that this young but vigorous company have a strong foot-hold in the South and that they are determined to hold it.

An accident which might have been attended with fatal results had it occurred a few hours later took place in the Laclede flouring mill, corner of Ninth and Souldard streets, St. Louis, on Thursday morning last, the cylinder head of the engine having been blown out, inflicting a damage to the building and machinery of over \$5,000. The head, which would weigh not less than 75 pounds, was blown through the wall and across the street, striking against the brick wall and falling on the sidewalk. The mill had been running night and day, and the accident will necessitate a stoppage for several weeks, besides throwing about thirty men out of employment. The assistant engineer was the only one in the engine room at the time

of the explosion, and he got out as soon as possible. The accident was caused by the breaking of the wrist-pin, by which the piston rod was connected with the crank. It is said the break in the pin had existed for a long time, and it is remarkable that the accident had not occurred before it did. J. B. M. Kehlor stated that the cylinder was a new one and cost \$2,000. He did not know but that under the circumstances he would call on the manufacturers of the cylinder to make good the loss. There being little margin in milling at present, Mr. Kehlor will not lose so much, but he will suffer considerably. Mr. Kehlor lost over \$100,000 recently by the burning of a mill at Waterloo, Ill.

"The amount of wheat now in store at Minneapolis," says the St. Paul Pioneer Press, "is nearly 4,000,000 bushels, and as the storage capacity is only 5,280,000 outside of the mills, it will not take long at the present rate to cause a blockade. However, all reports say farmers' deliveries are falling off, and the movement from the Southern roads, at least, is not likely to continue as heavy as it has. On the Northern Pacific and Manitoba roads in Dakota receipts have fallen off 50 per cent. during the past four days. The Northern Pacific Elevator Company is now receiving only about 12,000 bushels daily, against an average of 50,000 ten days ago. Other elevator companies report about the same falling off. Mr. Cargill, of Cargill Bros., who control the elevator lines on the southern branches of the Milwaukee road, was on 'change yesterday, and said farmers were selling very little wheat. Receipts dropped off about one-half at the last cut in prices, and he thought the movement would be further restricted. Farmers in Southern Minnesota and Iowa are in condition to hold their crops, and they are doing it. He looks for a very busy movement of the wheat from those sections next spring and summer. From present indications there will be no scarcity of wheat in the Northwest before the new crop comes in, notwithstanding the heavy movement up to this time. Many of the best informed dealers on 'Change believe the bottom of the decline has been reached and look for higher prices. Millers, who are constitutional bears, are also beginning to talk bullish, and say prices are too low."

About two months ago a prepossessing young man arrived in St. Marys, W. Va. By some means it soon became noised about that the young man, who gave his name as Charles Sargent, was the son of a New Orleans millionaire, and he was looking for a place in which to invest a portion of his wealth. He professed to have already invested largely in England, and as he had a voluminous correspondence from England, which reached him via New Orleans, this story was believed. Sargent, finally announced his intention of investing \$100,000 in flouring and saw mills in this country. He had a scheme to buy all the wheat and lumber to the exclusion of all other parties. The people were rejoiced. The local papers gave him notices, the prices of mill sites advanced, and everything was excitement in the village. Sargent was an eagerly sought guest. He was a faithful attendant at church, where he contributed liberally and ostentatiously. He formed companies for his mills, of all of which he held three-fourths of the stock and was treasurer. Sites were selected, plans considered, an architect engaged, etc. The first assessment was made last Friday, and all paid up. That night Sargent attended a church festival, where he made a speech, and gave the minister a \$20 bill as a personal gift. He went to his hotel afterward, and then no one knows where. Not content with swindling his partners in the mill business, he forged checks to the amount of \$375, on which he got the money. He beat his board bill and several store bills. He made about \$3,000 by his two month's visit to St. Marys, Pleasant county, W. Va.

The Case Mfg. Co., Columbus, Ohio, write us that they are in receipt of a large box of delicious oranges, sent direct and fresh from the Florida grove, owned by J. P. Felt. Mr. Felt is also the owner and successful operator of the "Emporium Mills," Emporium, Pa., which, two years ago, were enlarged and remodeled to the full roller system by the Case Mfg. Co. This is the second annual box received from Mr. Felt, and the Case Co. says, "we must say they are the most delicious fruit we have ever seen of the kind." They then, like Silas Wegg, drop into poetry thus:

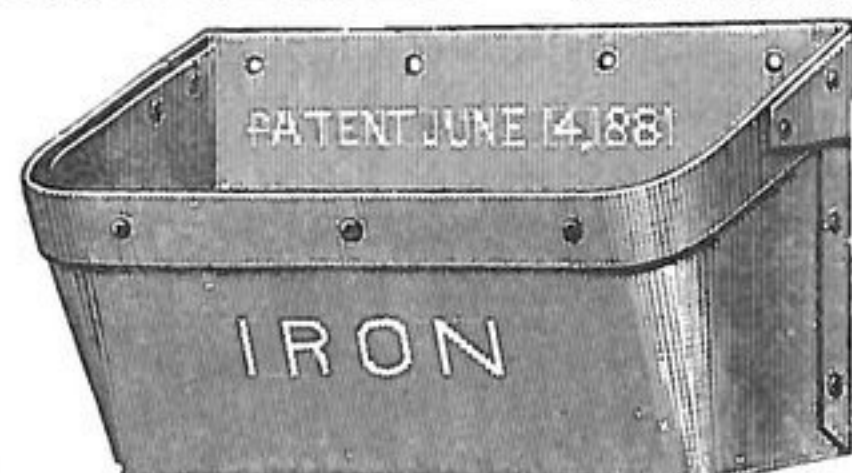
'Tis good to have a friend, friend Felt,
Who each returning year,
Will feel to'ards us as thou has felt,
And rich gifts send to cheer.
We have a number seven "Felt,"
Now on election due,
And when we get it we have felt,
Friend Felt, we'd send to you.
For fear that "Felt" we ne'er acquire,
We send you "Deals" fine flour trier;
But towards the—"Felt," will ere aspire.



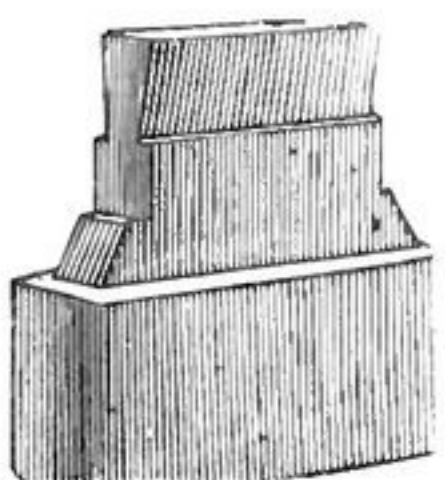
THE BOSS ELEVATOR CUP



is gaining favor every day. Over 13,000 sold in one day in three different States. My capacity in my new shop is 6,000 per week. I carry 30,000 cups in stock and can take orders of any size order.
W. P. MYER,
19 and 21 E. South St.
INDIANAPOLIS, IND.

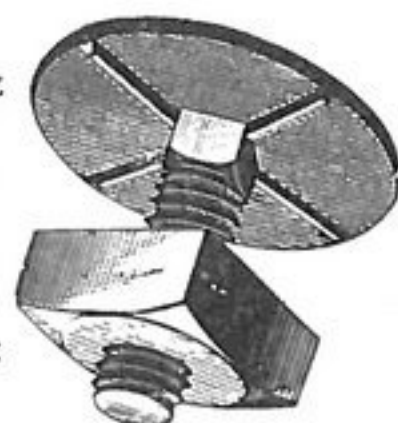


The Best Conveyor Flights



and Cogs. The Best
ELEVATOR CUPS

Bolts,
Cotton &
Rubber
Belting,
Best
Power
Corn
Sheller
at lowest
prices. Send for Circular.



A. H. FAIRCHILD & SON,
North Bloomfield, Ont. Co., N. Y.

ENDORSED BY THE HIGHEST AUTHORITY

The largest milling firm in America,

MESSRS. CHAS. A. PILLSBURY & CO.,

Minneapolis, Minn., having decided to rebuild the "Pillsbury B" Mill destroyed by fire in December, 1881, has placed the contract for the entire work of furnishing and erecting a strictly first-class roller mill of 1,500 to 2,000 barrels capacity, with

EDWARD P. ALLIS & CO.,

Reliance Works, Milwaukee, Wis. This is the largest mill ever contracted for in one contract in this country, and in placing the contract, the owners were influenced solely by the superiority of the machinery furnished and work done by Edward P. Allis & Co. It is further worthy of note that after a thorough trial of several years in the "Pillsbury A" and "Anchor" mills, owned by the same firm, in comparison with the Stevens, Downton, and various other roller mills, the celebrated

GRAY'S NOISELESS BELT ROLLER MILLS

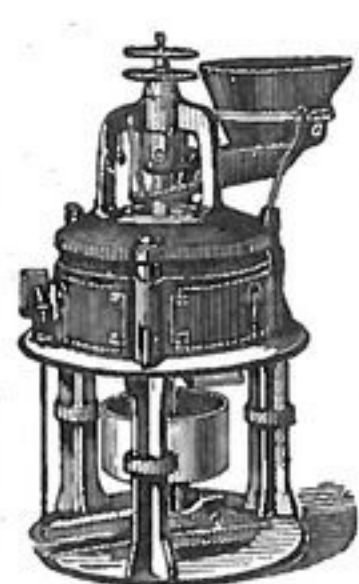
Were selected by Messrs. Pillsbury & Co, as being indisputably the best in every particular, and all bidders were required to figure on using these well-known machines. Parties from Buffalo and Indianapolis were not asked to figure on the work. The mill will be planned and erected under the supervision of the eminent milling engineer, Mr. Wm. D. Gray, and will add another to the long list of notable mills planned and built under his direction.

Buckwheat Refiners & Portable Mills



BREWSTER'S CELEBRATED
Buckwheat Refiner
Is the only machine
whereby the greatest
yields of
PURE, WHITE
SHARP FLOUR
can be obtained.
The only reliable, practical and durable machine
IN THE WORLD.

THE POSITIVE ADJUSTMENT
AND AUTOMATIC
MIDDINGS MILL
Is Strictly Self-Protecting
The Best Adjustment in
the World.
And the only
Perfect Granulator
Grinds Cool, Self-Oiling, Great
Saving of Power.
Simplicity and Durability
Combined.



Satisfaction Guaranteed on all our Goods. Send for Descriptive Circular, giving Prices, Sizes, Terms, etc.

BREWSTER BROS. & CO. Unadilla, N. Y.

TOOL FOR CUTTING, LEVELING & POLISHING THE FURROWS & FACE OF MILLSTONES

Eight inches long, 2½ inches wide, 1½ inches thick. Received the highest and only Award given to Polishers at the Millers' Exhibition, Cincinnati, Ohio, June, 1880.

For facing down high places on the buhr, this tool has no equal, and can be done much better and in one-sixth the time than with the mill pick. It is much larger, cuts better, can be used on either face or furrow, can be used until the corundum is entirely worn out on one side and then turned on the other side. Has over four times the amount of corundum and when the corundum is worn out can be replaced in the handle at a small cost. Sent by express, \$3.50. Satisfaction guaranteed, or money refunded. Address



HORACE DEAL, - BUCYRUS, OHIO.

FOR ENGINES & BOILERS

One to 30 Horse Power,
PRICE, FROM \$125 UPWARDS.

Steam Pumps, - \$35 and up.
Eclipse Tire Benders, 15 " "
Fan Blowers, - - 18 " "
Tuyere Irons, - - - \$2.50.

THE BEST IN THE MARKET!

For Circulars, Etc., Address,

THE LANCASTER STEAM PUMP CO.
AND MACHINE WORKS,

EZRA F. LANDIS, PROPRIETOR, LANCASTER, PENN.

WOLF & HAMAKER, MILL BUILDERS AND CONTRACTORS,

— MANUFACTURERS OF —

Wolf & Hamakers Latest Improved Middlings Purifier, Bolting Chests, Patent Feed for Rolls
AND THE KEISER TURBINE.

AGENTS FOR THE ALLIS ROLLER MILLS. BOLTING CLOTH

AND MILL FURNISHINGS OF EVERY DESCRIPTION.

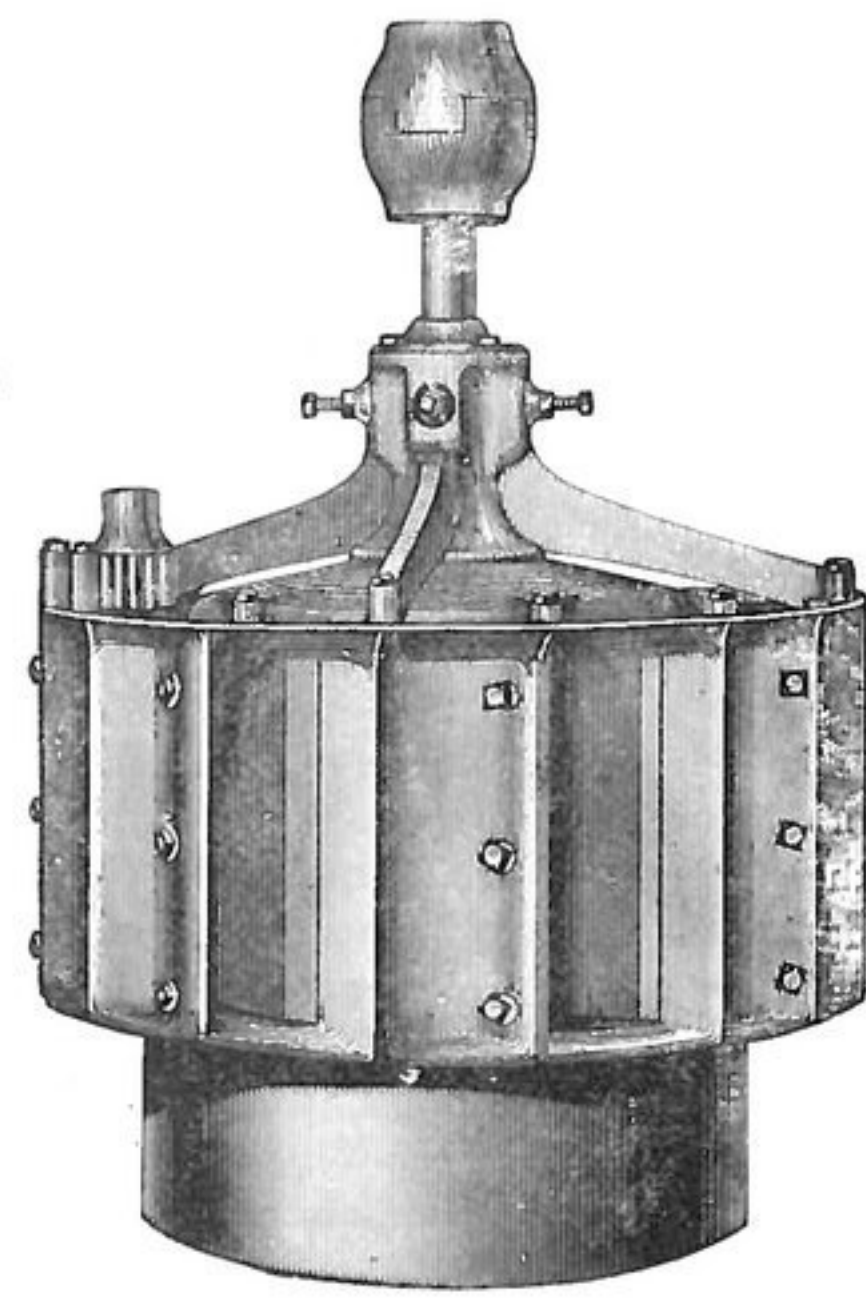
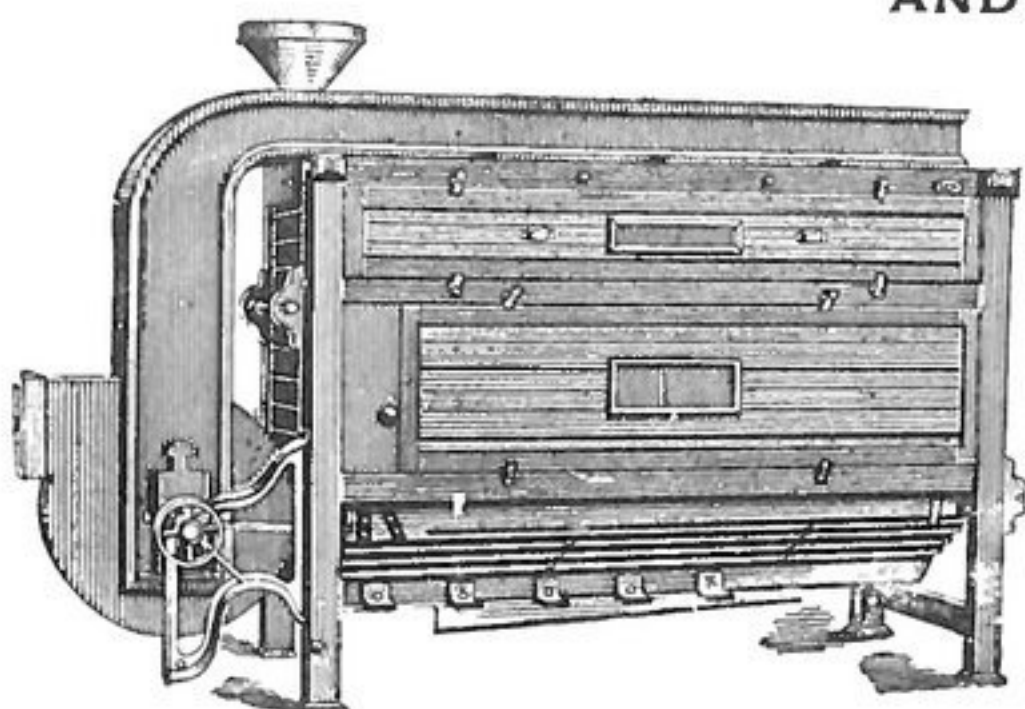
Wolf & Hamaker's Purifier is now manufactured as a single or double sieve machine to suit the wants of all millers. A perfect cloth cleaner. Results guaranteed to equal any machine for the work.

THE KEISER TURBINE.

ONLY BEST WHEEL BUILT Examine its construction and be convinced. The only wheel that really distributes and applies the water correctly and scientifically at all stages of gate, and at the same time closes water-tight and has an easy working balanced gate. **GET THE BEST**

We are the agents for the E. P. Allis Roller Mills and we are at all times prepared to furnish plans and estimates and to contract for the erection of first-class mills of any desired capacity of from 50 to 500 barrels. Parties contemplating new mills or the remodelling of old ones will find it to their interest to write us for prices and terms.

WOLF & HAMAKER, CHAMBERSBURG, PA.





NOTES.

Messrs. W. Rudd & Sons' (Middlesborough) new roller mills, 10 sacks per hour, erected by Seck Bros., will be started in the course of this month.

The Prefect of the Seine has appointed a commission consisting of three Municipal Councillors, two Municipal officials, two millers, and two bakers to settle the Assize of Bread, resolved on by the Municipal Council of Paris on Monday, Nov. 27.

The harvest report of the Manitoba Department of Agriculture states that the acreage under wheat has this season been 309,281, as against 260,842 in 1883, an increase of 18 per cent. The total yield is estimated at 6,205,620 bushels, and the balance for exportation at 4,746,058 bushels or 593,260 quarters.

In Germany there exists at present twenty-three jute mills, with 51,126 spindles and 2,340 power looms. There are, besides, a great number of single weavers occupied with this manufacture. Some 10,000 spindles are being established so that the total production, which amounted in 1883 to 770,000 cwts., will reach 1,044,000 cwts.

From 1873 to the beginning of 1884 the agricultural tenants' loss of capital in the United Kingdom is estimated by Mr. T. Smith Woolley at £73,500,000 sterling, equal to \$367,500,000. The profits of agriculture in the United Kingdom, according to this estimate, have been for the last ten years, worse than nil by \$367,000,000.

Henley flour mill, near Ipswich, was on Nov. 27, destroyed by fire, the work of an incendiary. The miller's house, which is close to the mill, and both of which were unoccupied, was also fired upstairs and down, but the design to destroy these premises was discovered and frustrated. This mill was a windmill, and had not been worked for a considerable time.

A master baker named George Carter was convicted by the justices of Staffordshire, of causing his servant to deliver bread without carrying scales and weights. The bread was weighed before being sent out and was of full weight; but the penalty was nevertheless enforced. Mr. Carter appealed against the conviction to the Queen's Bench Division, where the magisterial decision was, on Dec. 2 upheld.

The average wheat yields for fourteen years in Australia has been seven and two-thirds bushels per acre, and the commissioner urges that farmers should consider seriously the danger they ran from Indian competition. He predicted that India would eventually supplant South Australia in the European markets in regard to wheat production. The total area of land now open for purchase in South Australia is 2,193,678 acres. In the northern territory the best tracts have been alienated at an average of 4s. 5½d. per acre.

One of the best known of French milling engineers, Mr. Ch. Touaillon, died in Paris, last week, aged 73. The late Mr. Touaillon was the author of several well-known works on mill engineering as well as the inventor of several specialties; moreover, he was one of the staunchest supporters of the millstone as a flour making adjunct, and one of the bitterest opponents of the new fangled roller system. He was much admired for his unwavering straightforwardness, his high integrity, and his profound technical knowledge on all matters relating to the erection of flour mills.

Although very sanguine Indian wheat merchants claim that India is capable of supplying not only the wants of the United Kingdom, but of producing an unlimited supply, American wheat can be placed with a profit at a lower rate than Indian wheat can be sold in London, as a rule. The Indian railway system extends over 10,000 miles of track, and has scarcely penetrated the Central Provinces, which are the best adapted for wheat. Allowing a production for British India of 190,000,000 bushels, to which must be added 50,000,000 bushels from the protected States, not a fourth can be exported, as the wheat cannot be got out of the localities.

The Tariff Committee of the French Chamber of Deputies, according to cable report, states that the yield of cereals in France has steadily increased during the last thirty years. At present the average yield per hectare is equal to the average yield in America. It is stated that "the importation of grain from foreign countries has a tendency to influence prices and the values of the French production, by the maximum prices obtainable in France for cereals from India and America.

These could be sold for five or six francs per centner under the usual price. Consequently they are able to bear a duty of three francs without any resulting rise in prices." It is not clear, however, that the French people will regard such a duty as other than a tax upon themselves.

A meeting of the Edinburgh Association for the Prevention of Adulteration of Oatmeal was held in the Corn Exchange, on the 29th October. The Chairman (Mr. Inglis) intimated that he had received information from the north of Scotland which indicated that certain parties in that district were mixing meal made from barley and wheat with oatmeal, and selling the same as genuine oatmeal. This is a contravention of the Bread Act of 1836, which provides that all such mixing is illegal, and punishable with severe penalties. The meeting resolved to offer a reward of £20 sterling to any one giving such information as will lead to a conviction of parties contravening the Act. The agent of the Association was requested to carry out this resolution.

The *Mark Lane Express*, in its review of the grain trade for the week ending Dec. 13, says: Continued rains favor autumn-sown crops, especially wheat. The stoppage of threshing and the effect of the damp atmosphere on corn in transit has largely reduced the output, and the mildness of the weather renders trade slow and dragging, the tendency being against sellers. Sales of English wheat the past week, 61,240 quarters at 30s. 10d., against 70,130 quarters at 39s. 5d. during the corresponding period last year. Foreign trade depressed by the weather. Two cargoes have arrived off coast; five cargoes sold, two remained and ten are due. Flour depressed by recent large arrivals. Maize scarce and firm. Barley quiet. Oats dull. Beans and peas unchanged.

November has been a month of fair and genial weather on the whole, says the *Miller*, and though the last few days were very winter-like, the Martinmas period was especially fine and pleasant. Autumn wheat sowing and other farm work has made satisfactory progress both in England and on the Continent. The importation of wheat has been moderate for the time of year, and farmers as usual have threshed and delivered wheat freely. The depression in trade has been aggravated by a disproportionate fall in the value of flour. By a little care in buying a relative advantage of about 2s. per qr. can be realized by purchasing the manufactured instead of the unmanufactured staple. This is an obviously unsound position. The top price is now down to 33s., the lowest currency in the lists since a top price was established. Corresponding depression marks the other branches of the flour trade, and the lowest point of decline may with some confidence be stated to be already reached. The imposition of a duty on corn by France has been the chief economic event of the month, which, after witnessing three weeks of extraordinary depression in trade, leaves the markets dull indeed, yet not hopelessly weak as it found them.

In some of the leading British industries there would seem to be some improvement, crediting the latest mail reports, as published in the *London Times*. Thus, from Birmingham, "there is a good volume of business on home account for those who are prepared to work at low prices." Factories report more favorably of Irish trade in the cheaper descriptions of furnishing and agricultural hardware. There has been a little more animation of late in the Continental demand, chiefly on account of Spain and the North of Europe, but most of the Spanish orders now come through German channels, owing to the preferential tariff enjoyed by German traders." From Sunderland, the report is that the shipping trade is looked upon "by owners to have got pretty well to the bottom of the depression, not because there is no great animation in freights, but mainly because America is bound to ship a considerable quantity of grain during the winter, and having crops for which they are bound to find the money even at low prices. This already gives employment to a considerable number of ships, and charters are being effected two months ahead at rates that, although not leaving a large margin of profit, are certainly looked upon to do more than pay expenses, and be better than keeping the vessels laid up." Barrow-in-Furness reports: "There is still a firm tone in the hematite pig iron trade," and from Bermundsey come assurances that "transactions are fairly numerous."

*** THE INK ***
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QUEEN CITY PRINTING INK CO.
CINCINNATI, O.

CASE FLOUR MILL MACHINERY

TO CASE MFG. CO., COLUMBUS, O.

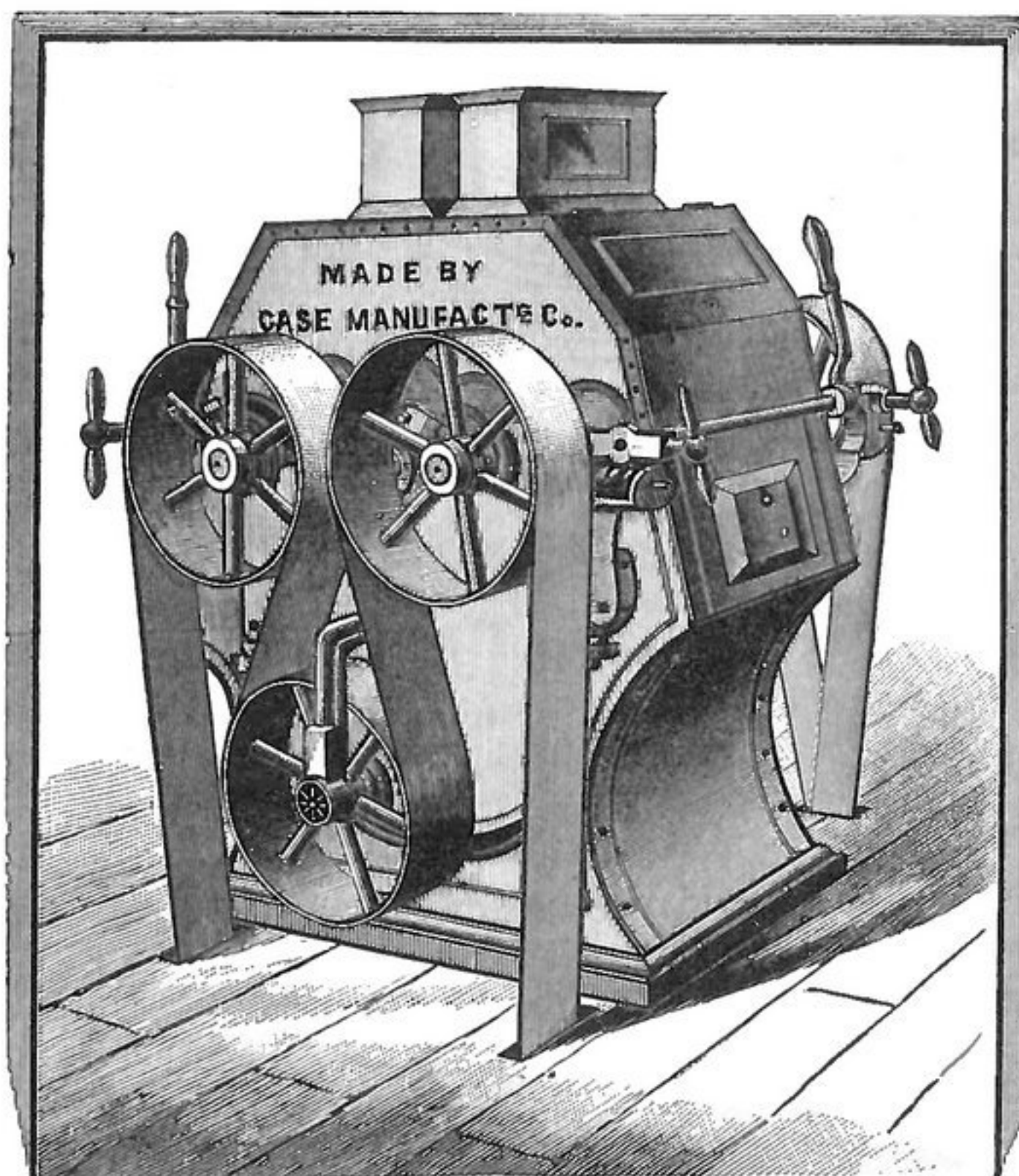
CANTON, OHIO, Dec. 17, 1884.

GENTLEMEN: The mill you erected on the Full Roller System, for Mr. Harvey, of this place, is doing work which cannot be beat in America. The flour is gaining in reputation, and will continue. It is superior to other best brands sold here. When they run off from twelve, fifteen, and eighteen per cent. of low grade, when we make LESS THAN THREE PER CENT., and our feed is as clean as any mill can show.

Yours truly,

R. W. DESHLER, Head Miller.

9x18 FOUR-ROLL MILL.
"BISMARCK."



9x18 FOUR-ROLL MILL.
"BISMARCK."

This is what we do for all our customers, and can do as well for you. Our system makes less "low grade" than any now in use. For low estimates address,

THE CASE MANFG. COMPANY

COLUMBUS, OHIO, U. S. A.

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Seamless Rounded Corners

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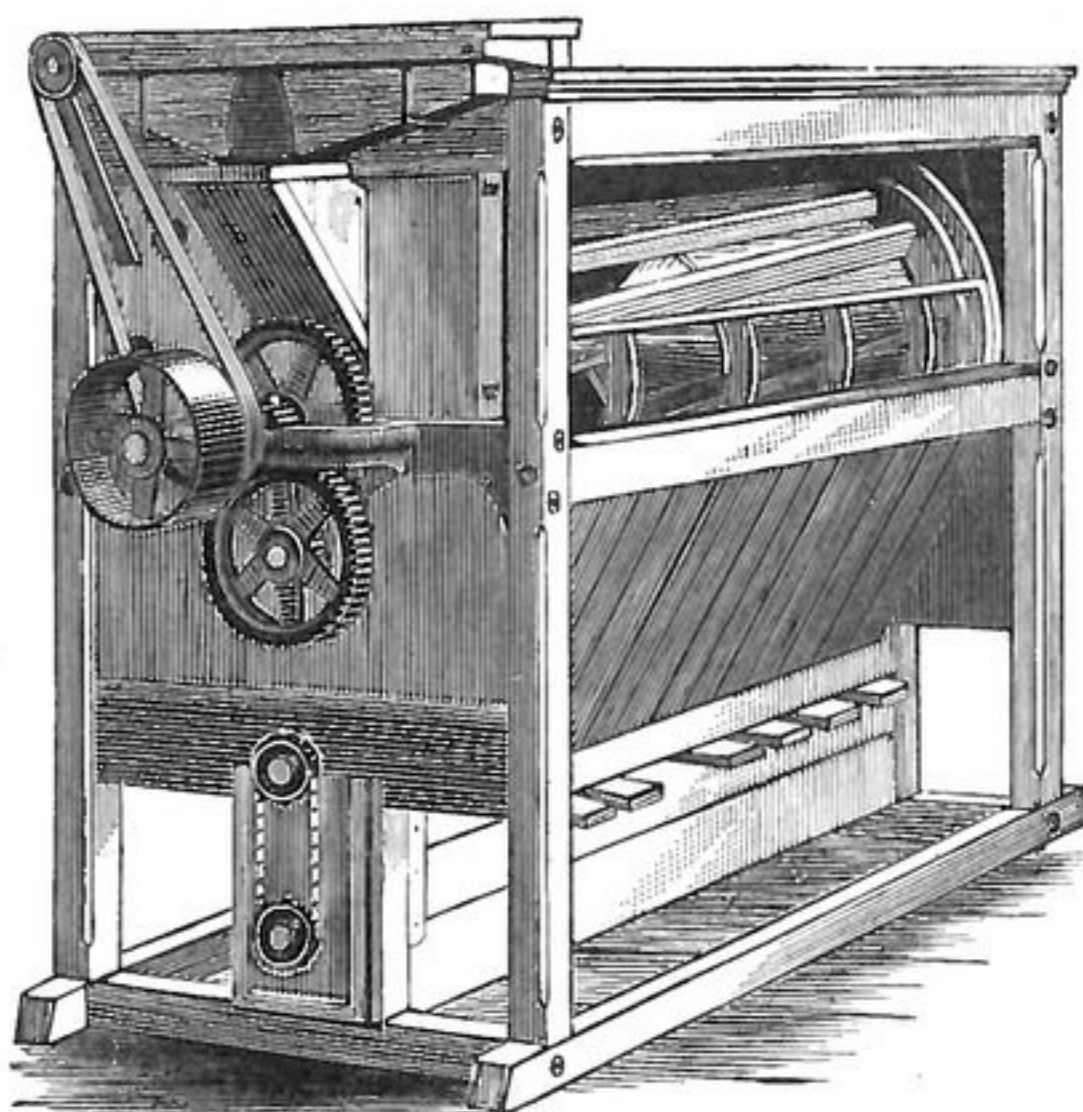
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IS BEYOND QUESTION THE
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While the operation of every
Machine is
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READ THIS LETTER. THEY WILL DO AS WELL FOR YOU.

OFFICE OF LUDLOW MILLS, DAYTON, OHIO, April 23, 1884.

MR. C. N. SMITH.

We have been running the two Centrifugals since February, the first without any stop whatever, and are well pleased with them. We throw less stock on our Rolls, and make four to five per cent. less Low Grade than before we had the Machine. You can refer any one to us and we will be pleased to give it a good send off. Wishing you success, we remain,
Yours respectfully,
CHAS. SHUEY, Head Miller.

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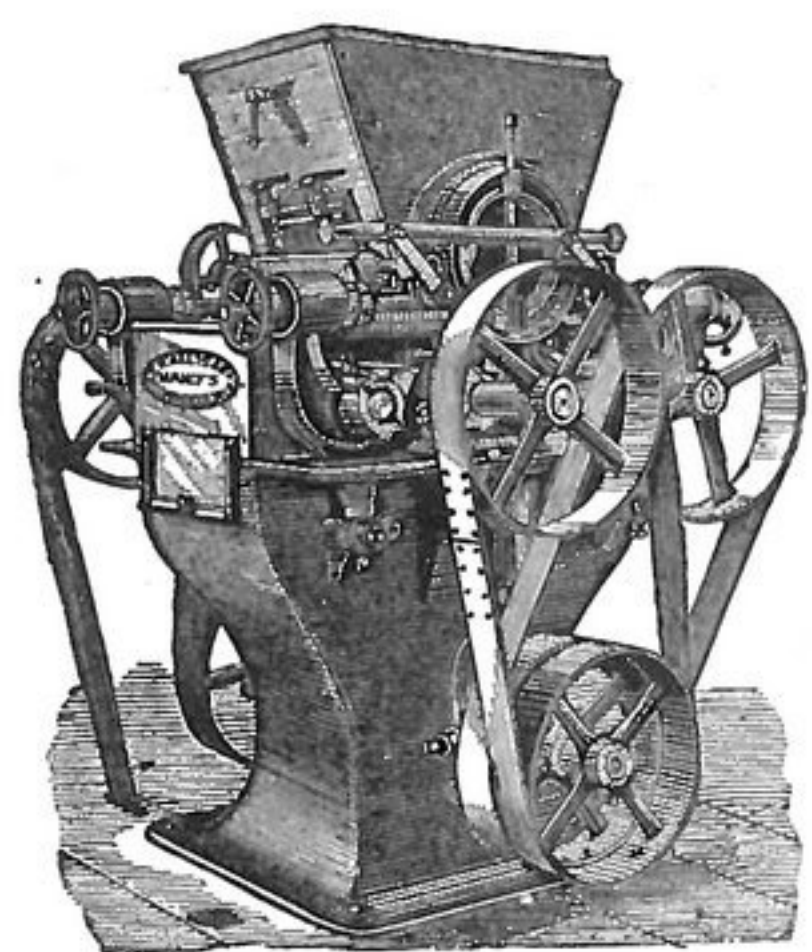
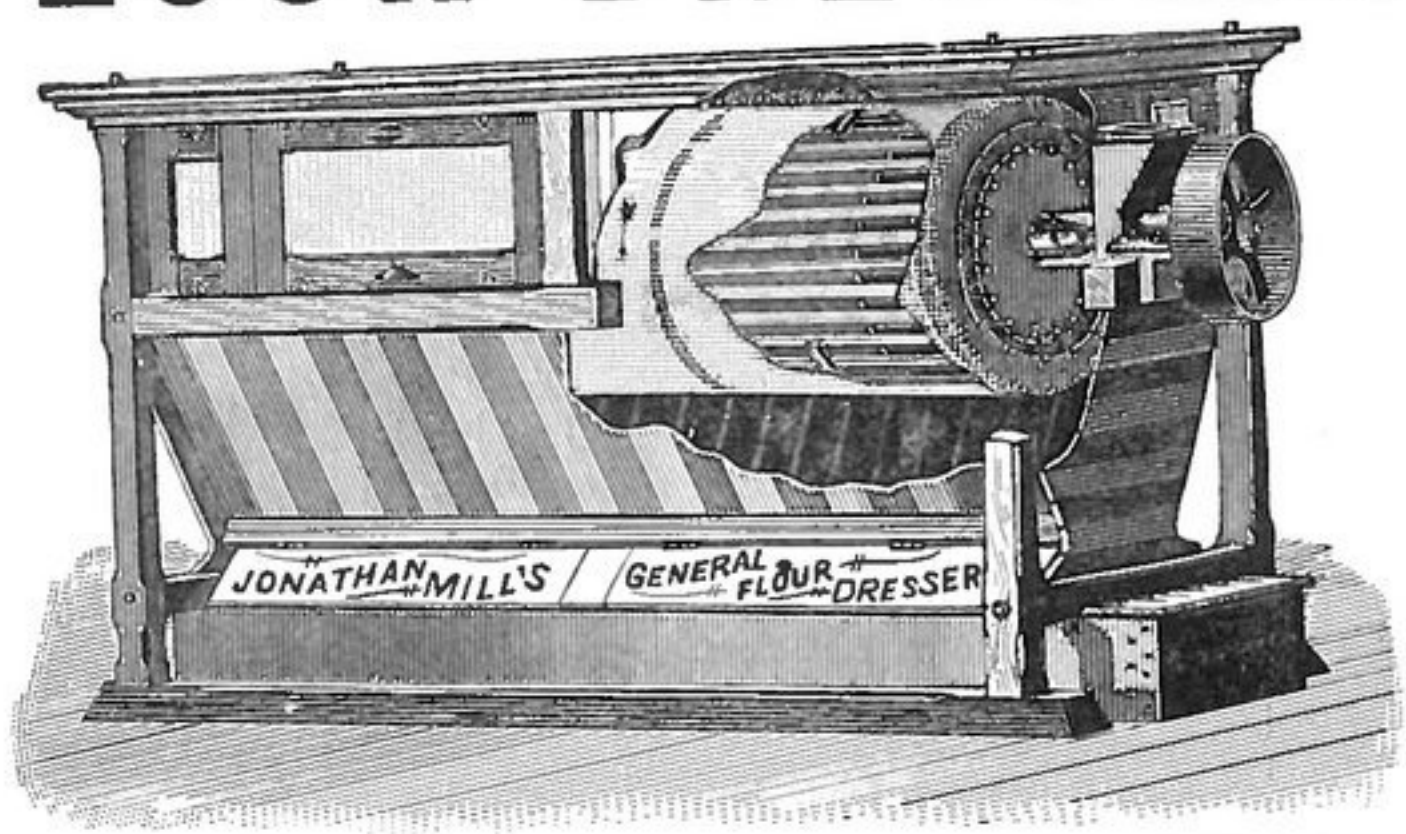
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SLOW SPEED. OCCUPIES SMALL SPACE, AND HAS IMMENSE CAPACITY.

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Send also for 150 Page Catalogue Describing their Engine



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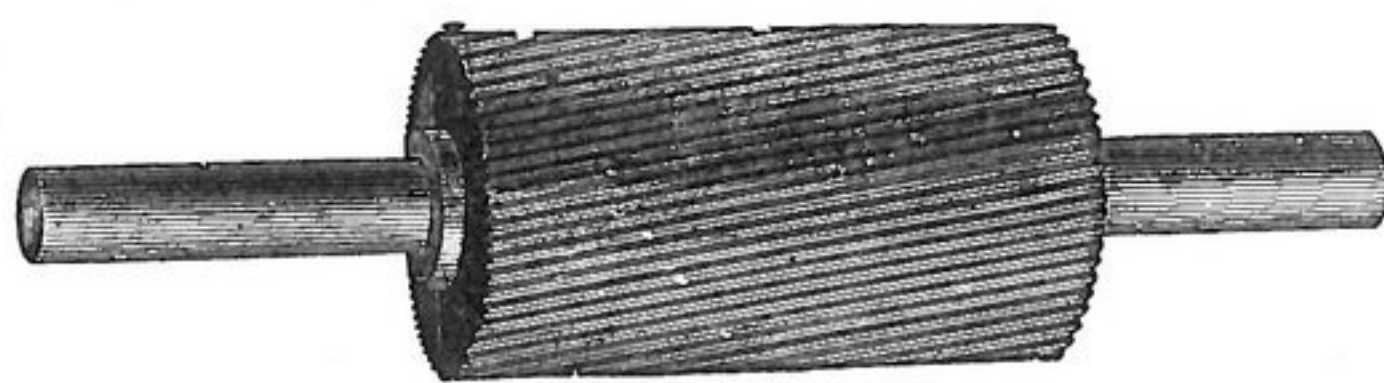
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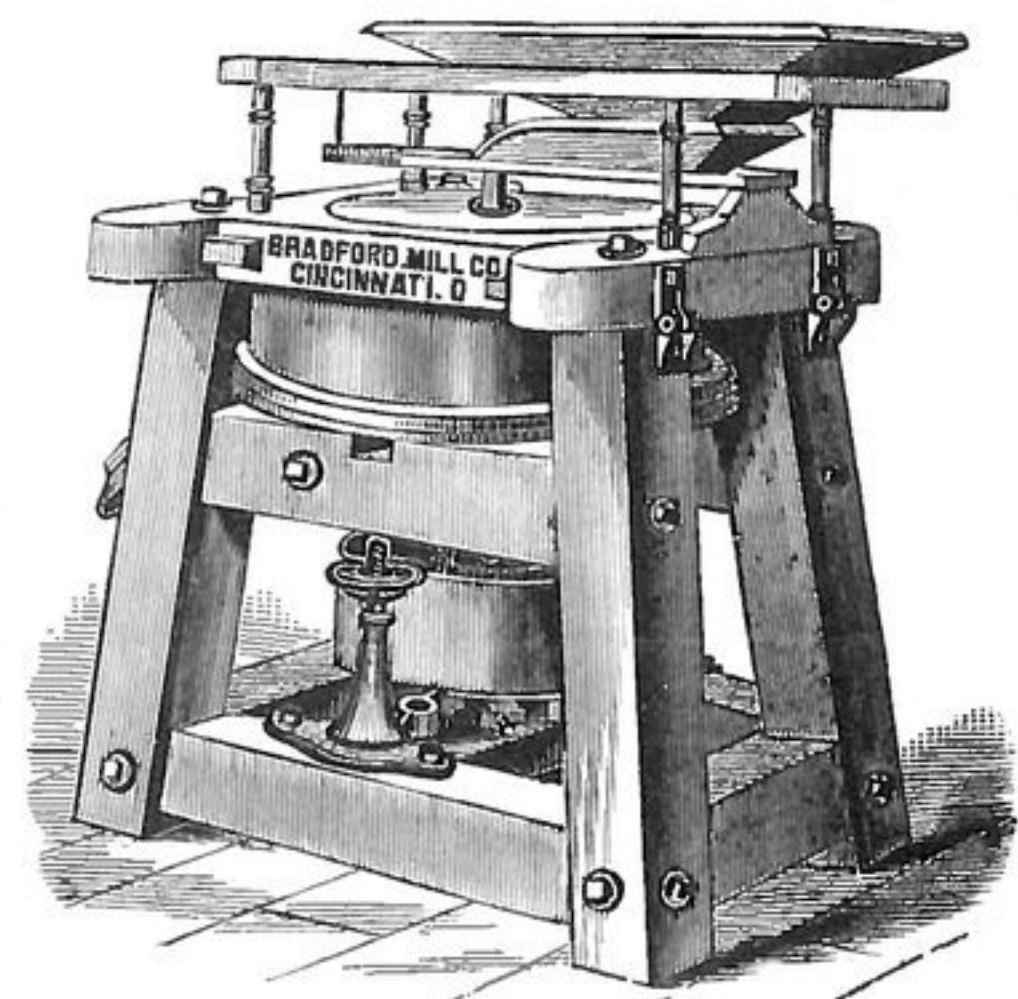
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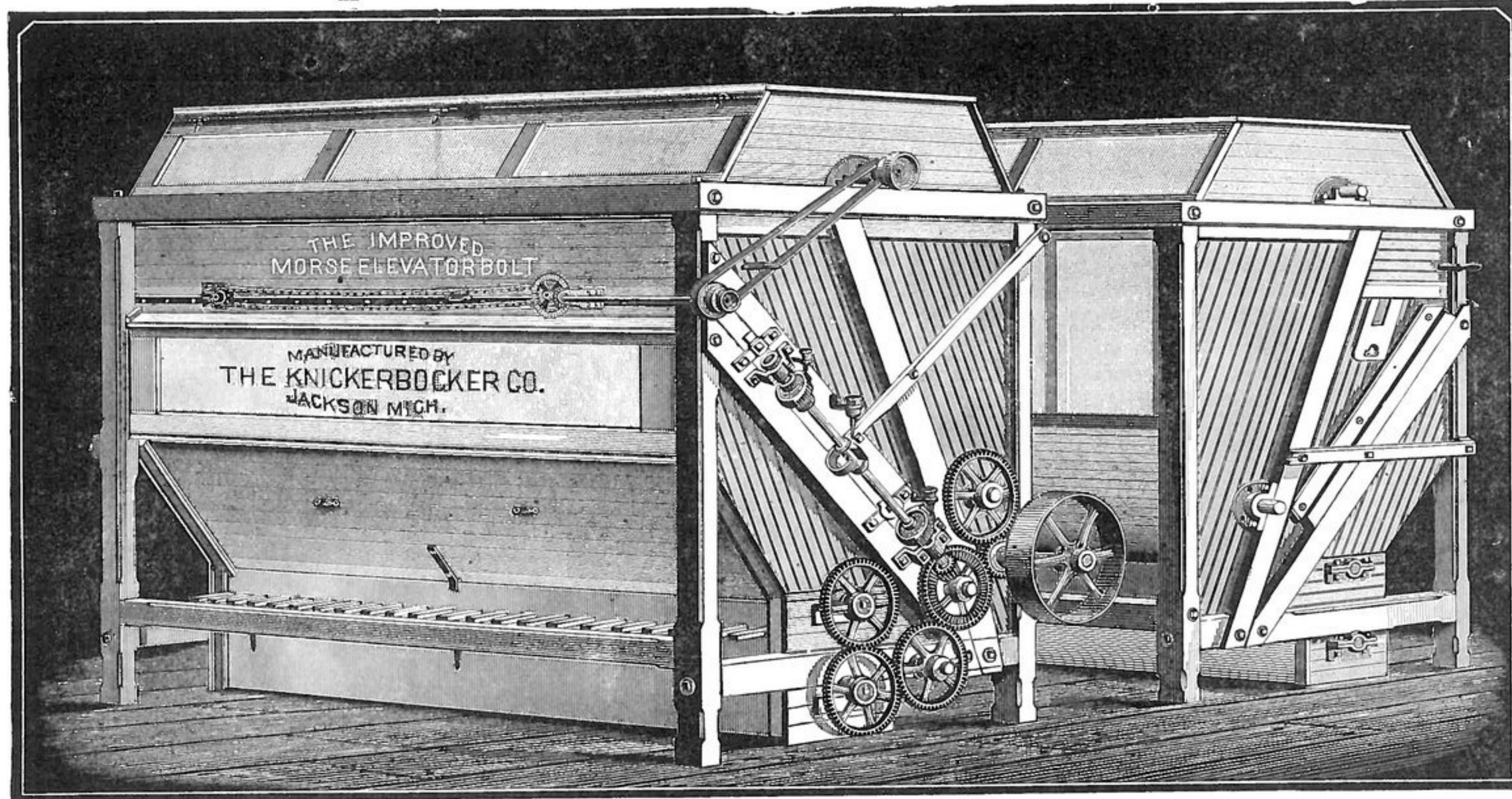


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The Improved Morse Elevator Bolt.



DEMONSTRATED IN OVER 100 MILLS TO BE THE BEST BOLTING DEVICE KNOWN.

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Manufacturers and Dressers of

MILL PICKS,

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GOLD MEDAL—SPECIAL, 1ST ORDER
OF MERIT.



Send for Circular and Price List.

Picks will be sent on 30 or 60 days' trial to any responsible Miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canada.

Toledo Mill Picks and Stone Tool Mfg. Co.

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Made of the very best double-refined English cast steel. All work guaranteed. For terms and warranty, address **GEO. W. HEARTLEY**, No. 297 St. Clair Street, Toledo, O. Send for Circular.

N. B.—All Mill Picks ground and ready for use (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

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All Warranted made of Best Quality Cast Steel 50 cents per pound.

All Sizes in Stock.

SOLID COTTON BELTING AND ELEVATOR BUCKETS.

Send for New Catalogue and Price List Just Out, to

SAMUEL CAREY, No. 17 BROADWAY, NEW YORK.

CAREY'S DOUBLE ANCHOR BOLTING CLOTH.



Office of THE MILLING WORLD.
Buffalo, N. Y., Dec. 24, 1884.

When one says there is no change to note from the observations of last week, the whole has been said concerning the wheat markets. The holiday season is on us and "trading" is of secondary importance. Not but what trading would be done were it possible to do it, but that no trading is more profitable. Foreign demand is not of a character to make the filling of orders remunerative, and almost every order accepted is made an excuse for an attempt to lower values. Much confidence is expressed that the inauguration of the New Year will witness a more active and profitable season. Will it, or is the wish father to the thought?

Concerning the flour market, the New York "Commercial Bulletin" says: The market for flour opens after the Christmas week fashion of being very dull; business has not been so dull in a month as we find it to-day. The weather is against the market for one thing, but under the most favorable circumstances it is a question whether buyers could be aroused to a point of interest until after the holidays are over. There is some buying going on, but it is only to piece out to assortments; the export demand is very light. Prices are about as before; somewhat nominal, somewhat irregular, and, for the medium grades the market is somewhat weak, but there is no quotable change anywhere. The market for rye flour is, if anything, rather more steady, with the demand fairly active at quotations appended. Buckwheat flour is quiet; no change in prices; with \$1.90@2.10 representing the general business, and \$2.15 and extreme price for fancy lots; the tone of the market is about steady. Corn goods continue in slow demand, with holders disposed to sell at former prices and buyers holding off. Mill feed continues moderately active and steady, at about yesterday's figures. The arrivals of track stuffs are light.

FOREIGN EXCHANGE.

The market for sterling was very dull, and fairly steady at the reduced rates. Posted rates closed at 4.81 for 60 days' and 4.85 for demand. The actual rates ranged: At 60 days' sight, 4.80½@4.80¾; demand, 4.84½@4.84¾; cables, 4.85@4.85½, and commercial, 4.79@4.79½. Continental exchange very quiet; francs, 5.25@5.21½; reichsmarks, 94¼@94½ and 94½; guilders, 39¾@39¾ and 40¾. The closing rates were as follows:

	60 days.	30 days.
London.....	4 81	4 85
Paris francs.....	5 28½	5 20
Geneva.....	5 22½	5 19½
Berlin, reichsmarks.....	94½	95½
Amsterdam, guilders.....	40	40½

BUFFALO MARKETS.

FLOUR—City ground clear Northern Pacific spring \$4.50@5.00; straight Northern Pacific spring, \$5.00@5.50; amber, \$5.00@5.15; white winter, \$4.75@5.25; new process, \$5.50@6.00; Graham flour, \$4.00@5.00. Western straight Minnesota bakers, \$1.75@5.00; clear do, \$4.50@5.00; white winter, \$4.75@5.00; new process, \$6.00@6.50; low grade flour, \$2.50@4.00. **OATMEAL**—Ingersol \$5.75; Bannerman's \$6.00; Akron \$6.25. **CORNMEAL**—Coarse, \$1.00; fine, \$1.10 per cwt. **RYE FLOUR**—In fair demand \$4.00@4.25. **WHEAT**—Quiet. Sales 7,100 bu. No. 3 Northern at 70c. and four car-loads No. 2 hard Northern Pacific at 80½c; for this grade at the Call Board 82c. asked 80c. bid Dec., 80c. bid Jan. 85½c. asked 85c. bid May; could be bought at 80½@81c. cash; for No. 1 Northern, 80c. asked 78½c. bid cash, 84c. asked 80c. bid May. **CORN**—Scarce and quiet. At the Call Board 48c. asked 42c. bid May. **OATS**—No. 2 white Western, 31c; No. 2 mixed, 29@28½c; white State from wagons, 32@33c. **BARLEY**—Demand fair. Sales twelve car-loads Canadian at 72½c and five do. do. at 77c. on track. **RYE**—State nominal at 53@54c. and Western at 58½@59c.

THE ELEVATOR TAX ON GRAIN.

The Special Committee of the New York Produce Exchange having in charge the consideration of the excessive rates imposed upon grain in the elevators of the railroad companies, called upon Mr. Albert Fink, the Trunk Line Commissioner on Friday last and made an argument against the retention of the one cent per bushel charge, which they claimed was unduly discriminating against New York and in favor of Philadelphia and Baltimore. The Committee consisted of E. R. Livermore, George T. Martin and Henry T. Kneeland. Mr. Fink received them courteously and listened with attention to their statement. The grain trade in Baltimore and Philadelphia had been

built up within a few years, the Committee said, from almost nothing, because of the light terminal charges as compared with New York. These two cities are at a natural disadvantage as compared with this town, owing to their heavy grades and other natural drawbacks, but their wharves were advantageously placed in relation to the railroads. Still, with all the energy that the grain trade of these two places can show, they would not compete on equal terms with us if it had not been for the cent per bushel charge. By this we are handicapped and made really to pay out money so as to place us on the same ground that they are. The railroad companies denied that this was a permanent arrangement when it began, although they said it might be equitable for the time. They had said that they did not assume that the rates which were just then would be just indefinitely. It was said by them that they became a temporary arrangement only. The Committee, therefore, asked Mr. Fink to lay before the railroads not only their views, as previously expressed, but those they now uttered, and felt sure that if there was any force in the argument they had used against the Produce Exchange people at former times that they would accept it and be guided by it now. Mr. Fink promised to give the matter his earnest consideration and to lay it before the various railroads.

THE Department of Agriculture at Washington reports prices of farm produce in the home markets. The tendency to a general decline in prices appears to have depressed values somewhat, aside from the abundant supply. The average price of corn is 36½ cents, one cent lower than the average for 1879, when the supply, in proportion to population, was quite as large. It has been lower but twice in ten years—in 1877 and 1878, after the two previous years' abundance. It is highest in Florida—80 cents per bushel—and the lowest price is 18 cents, in Nebraska; Kansas, 22c; Iowa, 23c; Missouri, 26c; Illinois and Minnesota, 31c; Indiana and Wisconsin, 34; Michigan, 40; Ohio, 41; Kentucky, 43c. It is 52c in Pennsylvania, 54c in New Jersey and 60 cents in New York. The range of values in the South Atlantic states is from 36 cents in Delaware to 72 cents in South Carolina. In the more western states it is 45 cents in Tennessee, 54 in Arkansas, 61 in Alabama, 62 in Mississippi and Texas and 67 in Louisiana. The average farm price of wheat is 65 cents per bushel, against 91 cents last December. The December prices in thirteen years has previously been below \$1 per bushel but five times—in 1874, 1878, 1880, 1882 and 1883. The average in Nebraska is 42 cents, 45 in Kansas, 46 in Dakota, 50 in Minnesota, 55 in Iowa, 62 in Missouri, 63 in Illinois, 67 in Indiana, 74 in Michigan and 75 in Ohio. The average of home-grown wheat in New England exceeds \$1. In New York it is 85 cents, Pennsylvania 86, Virginia 80, and 83 in Maryland. The average value of oats is 28 cents, against 33 cents last December and 37 cents in 1882. The present value is the lowest ever reported by the department. The lowest state averages are 19 cents in Nebraska, and the highest, 60 cents, in Florida. Iowa and Minnesota, 20 cents; Kansas, 22 cents; Illinois, 23 cents; Indiana, 27 cents, and Ohio, 29 cents. The range is from 42 cents to 60 cents in the South. The plantation prices of cotton ranged from 9 to 9½ cents per pound. It is 9 cents in Tennessee, Arkansas and Texas; 9.1 cents in Louisiana; 9.2 cents in Georgia; 9.3 cents in the Carolinas and Virginia. The average farm price of the entire crop of potatoes is 40 cents per bushel. The lowest price is 25 cents in Michigan. The average in New York is 37 cents; 42 cents in Ohio; 35 cents in Indiana; 34 cents in Illinois; 28 cents in Iowa; 29 cents in Nebraska, and 48 cents in Kansas. The average price is 2 cents lower than last year, though the crop is not so large.

NOTES.

The Black Log flouring mill at Oppelsville, Pa., which has on account of the dry weather been idle since spring is in operation again.

A St. Louis miller says: "We do not send flour to Cuba direct. Much of it is consigned to New York and New Orleans, and thence to Cuba. If we sell direct, the purchasers specify some New York house, on which we draw at sight. I think, however, that more than 100,000 barrels of my own flour have been sold in Cuba in one year. A great deal of American flour has gone to Spain and thence to Cuba, as the duty on Spanish flour is but \$2 and on American flour about \$6."

JAMES S. MCGOWAN & SON,
SHIPPING AND COMMISSION MERCHANTS.

Choice Milling Wheats a Specialty
Room 60 Board of Trade Building.
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No Charge for Inspection

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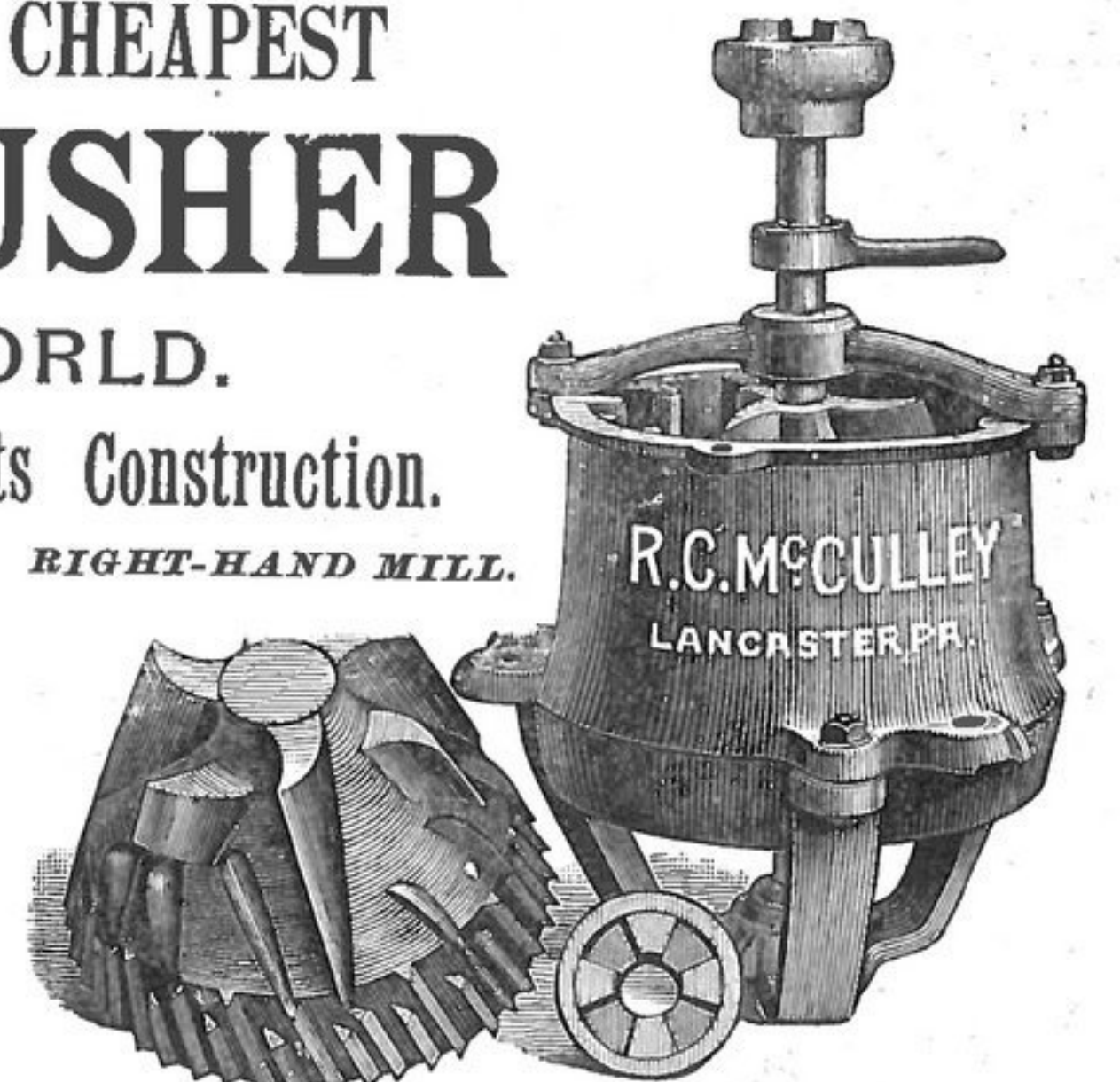
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AGENTS WANTED EVERYWHERE.
CAPACITY 75 BUSH. PER HOUR.

Thousands of these Crushers are now in use, and giving entire satisfaction.

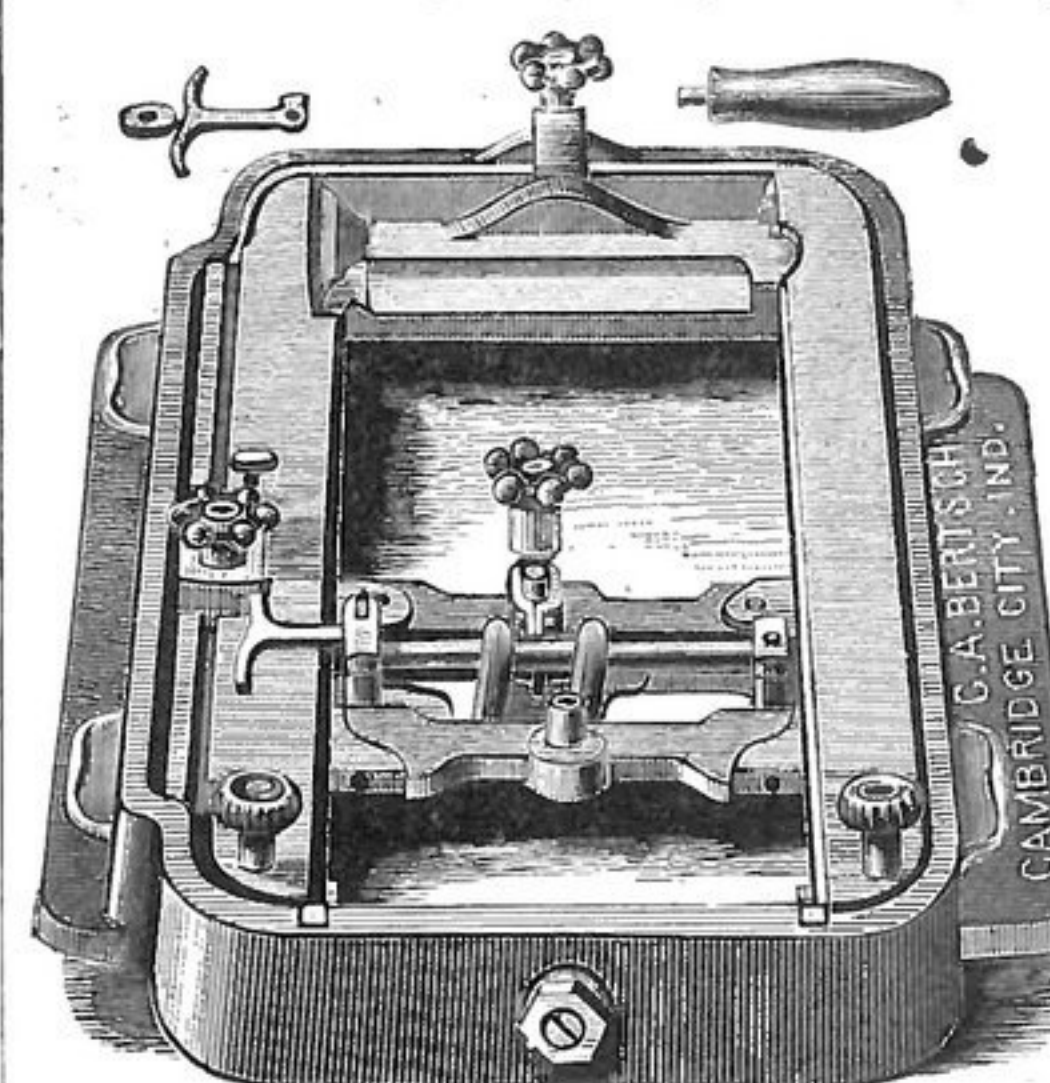
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GOVERNORS { For Water Wheels } Cohoes Iron Foundry & Mch. Co.
Send for Catalogue. Cohoes, N. Y.

Teetor's Patent Quick Adjustable Diamond Dresser



The A Machine. 29 inches long, 18 inches wide. Weight, 145 pounds. Same width carriage as the B machine.
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while it also includes all minor departments of rural interest, such as the Poultry Yard, Entomology, Bee-Keeping, Greenhouses and Grapery, Veterinary Replies, Farm Questions and Answers, Fireside Reading, Domestic Economy, and a summary of the News of the Week. Its MARKET REPORTS are unusually complete, and much attention is paid to the Prospects of the Crops, as throwing light upon one of the most important of all questions—When to Buy and When to Sell. It is liberally Illustrated, and is intended to supply, in a continually increasing degree, and in the best sense of the term, a

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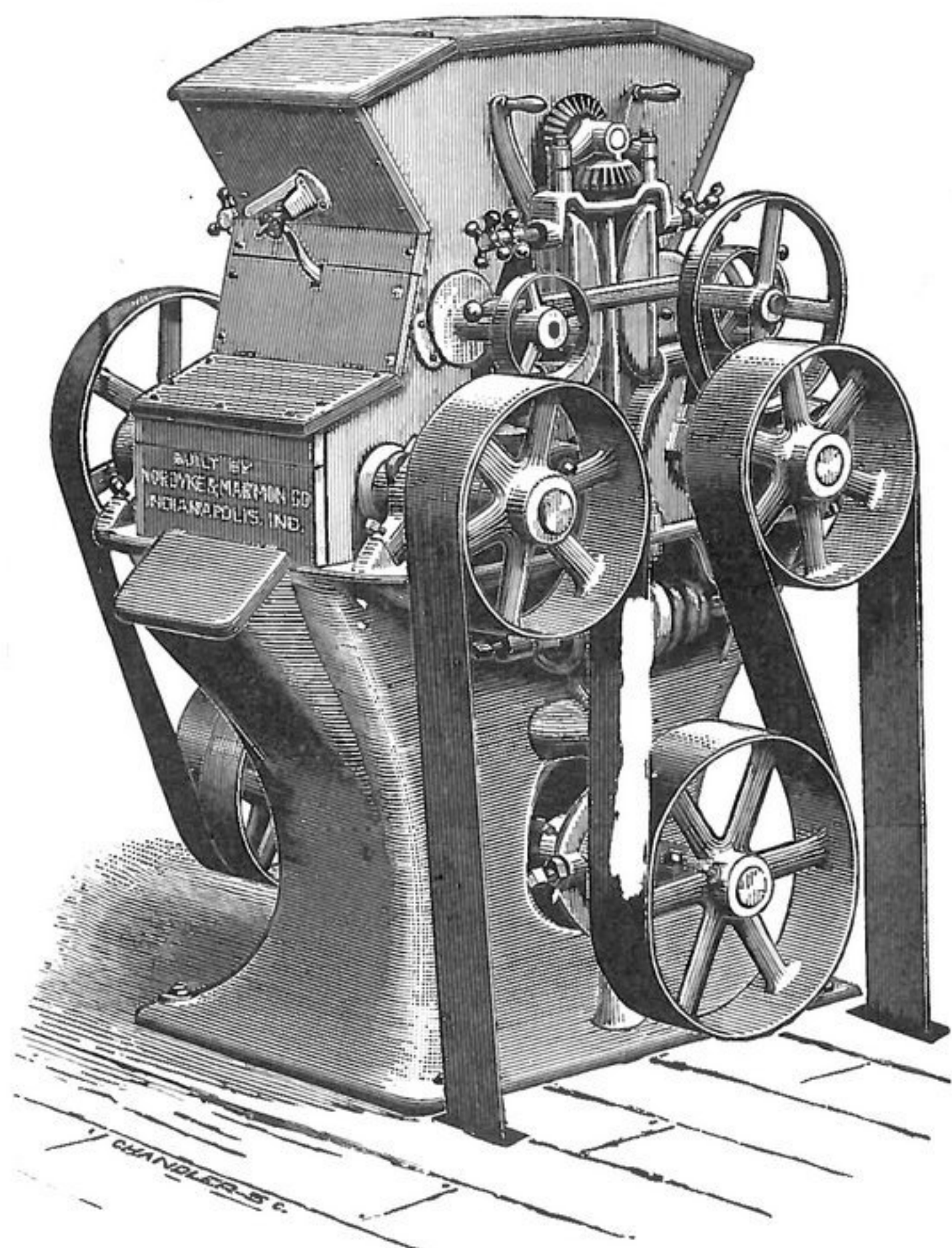
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Builders from the Raw Material of

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WE ARE THE SOLE OWNERS FOR THE UNITED STATES OF ALL THE PATENTS UPON THIS ROLLER MILL.



This Is the Only Roller Mill Made Having All the Essentials Needed In Successful Milling.

500 BARREL MILL IN MISSOURI.

Read what an Old Miller who has Thirty-Four Pairs of these Rolls in Constant Use, Says:

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: In regard to the workings of our new mill erected by you, will say it is fully up to and beyond our expectations. Our average work is fully 33 per cent. over your guarantee. Since starting our mill last July we have had no complaint of our flour from any market where sold. It gives universal satisfaction, and we have it scattered on the trade from Chicago to Galveston, Texas. Our yields are all that are attainable. We have tested it on both Spring and Winter wheats with satisfactory results on both varieties. Since the mill was turned over to us we have not changed a spout or a foot of cloth, nor have we found it required to make any changes. We have run as long as six days and nights without shutting steam off the engine, not having a "choke" or a belt to come off. The mill is entirely satisfactory to us, and for a fine job of workmanship, milling skill and perfection of system, we doubt if it is surpassed in the United States to-day. It is certainly a grand monument to the ability and skill of Col. C. A. Winn, your Milling Engineer and Designer. You may point to this mill with pride and say to competitors, "You may try to equal, but you will never beat it." Wishing you the success that honorable dealing deserves, I am,

OFFICE OF DAVIS & FAUCETT MILLING CO.,
ST. JOSEPH, MO., Nov. 28th, 1883.

Yours, etc., R. M. FAUCETT, Pres.

500 BARREL MILL IN ILLINOIS.

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: We started up our mill in June last year, and it gives us pleasure to say that your Roller Mills are doing splendid work and give us no trouble. Your milling program required no changes, and concerning yields, we get all the flour from the offals, and we sell our best grades in the principal markets of the United States at the highest prices offered for any flour. All the machinery made by you is first-class, and we would not know where to purchase as good.

OFFICE OF DAVID SUPPGER & CO.,
HIGHLAND, ILL., Jan. 10, 1884.

Yours respectfully, DAVID SUPPGER & CO.

125 BARREL MILL IN INDIANA.

NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: The 125 barrel All Roller mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading mill furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantees, and the capacity runs over your guarantees. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.

LAPEL, MADISON COUNTY, IND., Jan. 10, 1884.

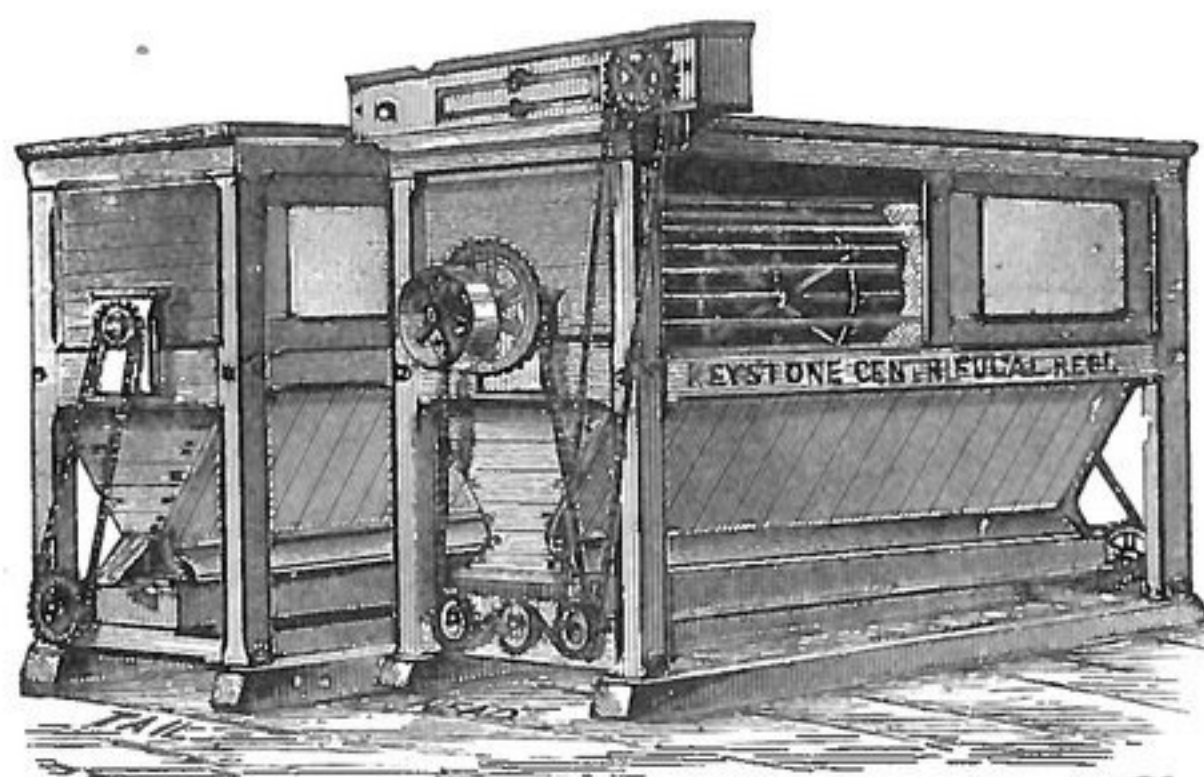
Yours truly, J. T. FORD.

Letters on file in our office from a large number of small roller millers giving as favorable reports as above. A portion will be published as occasion demands.

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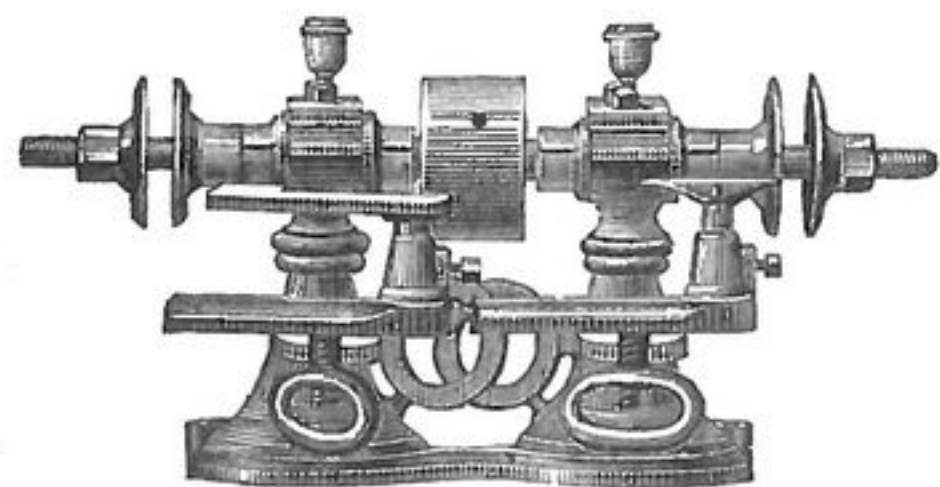
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use by millers. It is much cheaper, and can be applied by an inexperienced person. It is perfectly of French Burr Stone, wears evenly with it, and not only fills the cavity, but adheres to and betirely of this preparation. The Leading Makers are Adopting it to Build their Millstones. For We cannot open an account for so small a sum, therefore Cash should be sent with order, otherwise furnish in bbls. of 300 lbs. Price upon application. Emery Rub Stones, for hand use in Finishing Faces of Millstones.



Emery Wheel Machine No. 0 Has 3/4 Inch Arbor.

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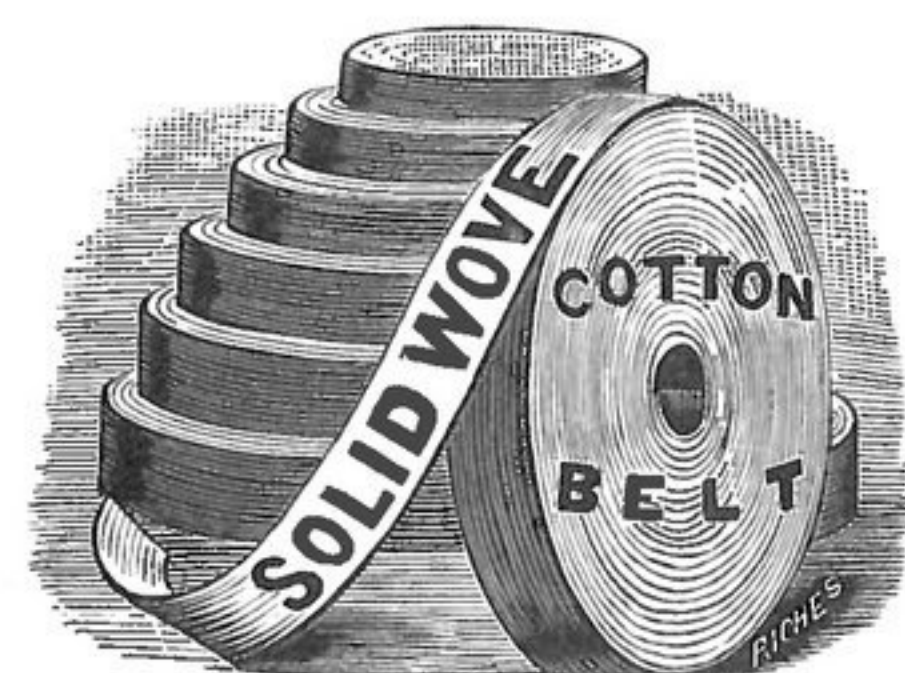
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And Re-corrugated to order. Porcelain rolls re-dressed. Our Machinery for this purpose is very accurate. Can do work promptly.

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It will be equipped with SMITH PURIFIERS, SMITH CENTRIFUGALS, and

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The power will also be supplied by the SMITH Co. It is intended to make this a MODEL CENTRIFUGAL ALL ROLLER MILL, open to the inspection of the world. Competitors for placing the rolls in this mill appeared from *Milwaukee, Indianapolis, Grand Rapids*, and many other points, but the award was made solely upon the acknowledged merits of our rolls for their CAPACITY, QUALITY OF WORK PRODUCED, HORIZONTAL AND PERPENDICULAR ADJUSTMENTS, FEEDING DEVICE, and general substantial appearance and worth. Success is the true test of merit.

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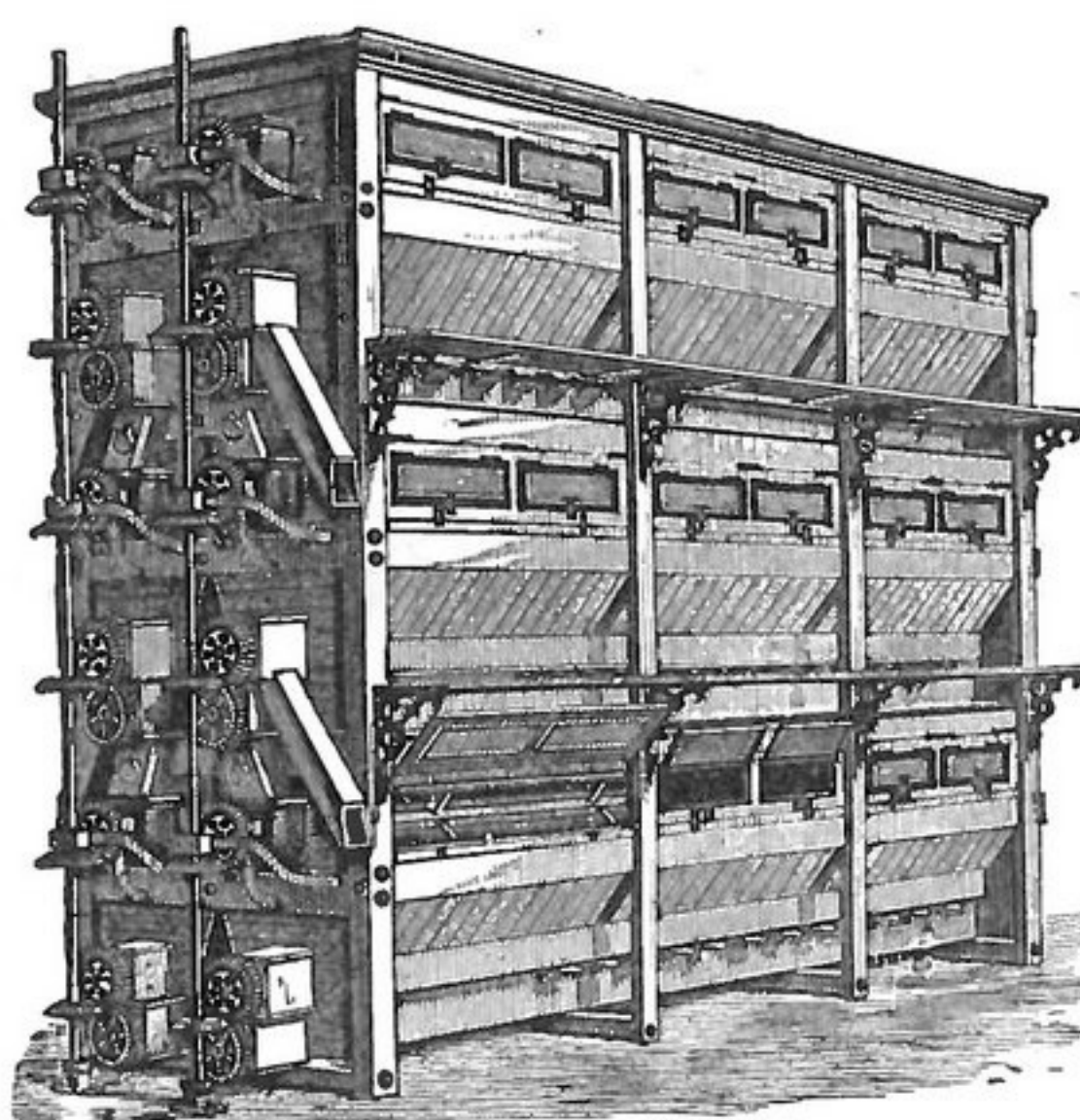
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